ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES IN THE STATE OF NEW YORK PHASE I INVESTIGATIONS

NYSDOT SPILL NO. 811902
VILLAGE OF PAWLING, DUTCHESS COUNTY, NEW YORK
SITE CODE: 314060

Prepared for

DIVISION OF SOLID AND HAZARDOUS WASTE
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 WOLF ROAD
ALBANY, NEW YORK 12233-0001

Prepared by

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WE Project No. 06281

February 1987

1.0 EXECUTIVE SUMMARY

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The NYSDOT Spill No. 811902 site (New York Site Code 314060) is located along Route 22 in the Village of Pawling, Dutchess County, New York (Figure 1). The site consists of five parcels, approximately 20 acres in size. Groundwater in the vicinity of the site has been contaminated with petroleum hydrocarbons since the spring of 1982. Analytical data from samples taken at five private residences located in the vicinity indicate the presence of gasoline in each of the wells.

Subsequent hydrogeologic investigations by Empire Soils Investigations, Inc. and Thomson Associates identify the Amoco Station located along Route 22 in the Village of Pawling to be the major source of hydrocarbon contamination.

The preliminary Hazard Ranking System (HRS) scores for the NYSDOT Spill No. 811902 site are as follows: Migration Score (S_M) = 38.17; Direct Contact Score (S_{DC}) = 12.50; Fire and Explosion (S_{FE}) = 0. The migration score is attributable to a direct observed release to groundwater.

A Phase II work plan has not been suggested at the NYSDOT Spill No. 811902 site. The site is recommended for consideration by the NYSDEC Bureau of Remedial Action.

HRS WORKSHEETS

Facility Name: NYSDOT Spill No. 811902

Location: Route 22, Pawling, New York

EPA Region: II

Person(s) in Charge of the Facility:

Name of Reviewer: Stephen R. Petrisko **Date:** November 4, 1986

General Description of the Facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

Gasoline contaminated water supply wells located in a commercial area along Route 22 in Pawling, New York. Chemicals present in wells include benzene, toluene, m-xylene, o-xylene, ethyl benzene, tetrachloroethylene, and dichlorobenzene.

Scores: $S_M = 38.17$ ($S_{gw} = 65.62$ $S_{sw} = 7.44$ $S_a = 0$)

$S_{FE} = 0$

$S_{DC} = 12.50$

HRS COVER SHEET

GROUND WATER ROUTE WORK SHEET

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 (45)	1	45	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 3	2		6	
Net Precipitation	0 1 2 3	1		3	
Permeability of the Unsaturated Zone	0 1 2 3	1		3	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score				15	
3 Containment	0 1 2 3	1		3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8	1	1	8	
Total Waste Characteristics Score			19	26	
5 Targets					3.5
Ground Water Use	0 1 2 (3)	3	9	9	
Distance to Nearest Well/Population Served	0 4 6 8 10 12 16 18 20 24 30 32 (35) 40	1	35	40	
Total Targets Score			44	49	
6 If line 1 is 45, multiply 1 x 4 x 5. If line 1 is 0, multiply 2 x 3 x 4 x 5			37,620	57,330	
7 Divide line 6 by 57,330 and multiply by 100	S_{gw} = 65.62				

SURFACE WATER ROUTE WORK SHEET

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45	1	0	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	0 1 2 (3)	1	3	3	
1-yr. 24-hr. Rainfall	0 1 (2) 3	1	2	3	
Distance to Nearest Surface Water	0 1 2 (3)	2	6	6	
Physical State	0 1 2 (3)	1	3	3	
Total Route Characteristics Score			14	15	
3 Containment	0 1 2 (3)	1	3	3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8	1	1	8	
Total Waste Characteristics Score			19	26	
5 Targets					4.5
Surface Water Use	0 1 (2) 3	3	6	9	
Distance to a Sensitive Environment	(0) 1 2 3	2	0	6	
Population Served/Distance to Water Intake Downstream	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
Total Targets Score			6	55	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			4,788	64,350	
7 Divide line 6 by 64,350 and multiply by 100	S_{sw} = 7.44				

AIR ROUTE WORK SHEET

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45	1	0	45	5.1
Date and Location:					
Sampling Protocol:					
If line 1 is 0, the S = 0. Enter on line 5. If line 1 is 45, then proceed to line 2.					
2 Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
3 Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
	Total Targets Score			39	
4 Multiply 1 x 2 x 3				35,100	
5 Divide line 4 by 35,100 and multiply by 100	S_a = 0				

	S	S^2
Groundwater Route Score (S_{gw})	65.62	4,305.98
Surface Water Route Score (S_{sw})	7.44	55.35
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		4,361.33
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		66.04
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73$		$S_M = 38.17$

WORKSHEET FOR COMPUTING S_M

Insufficient data to score this route

FIRE AND EXPLOSION WORK SHEET

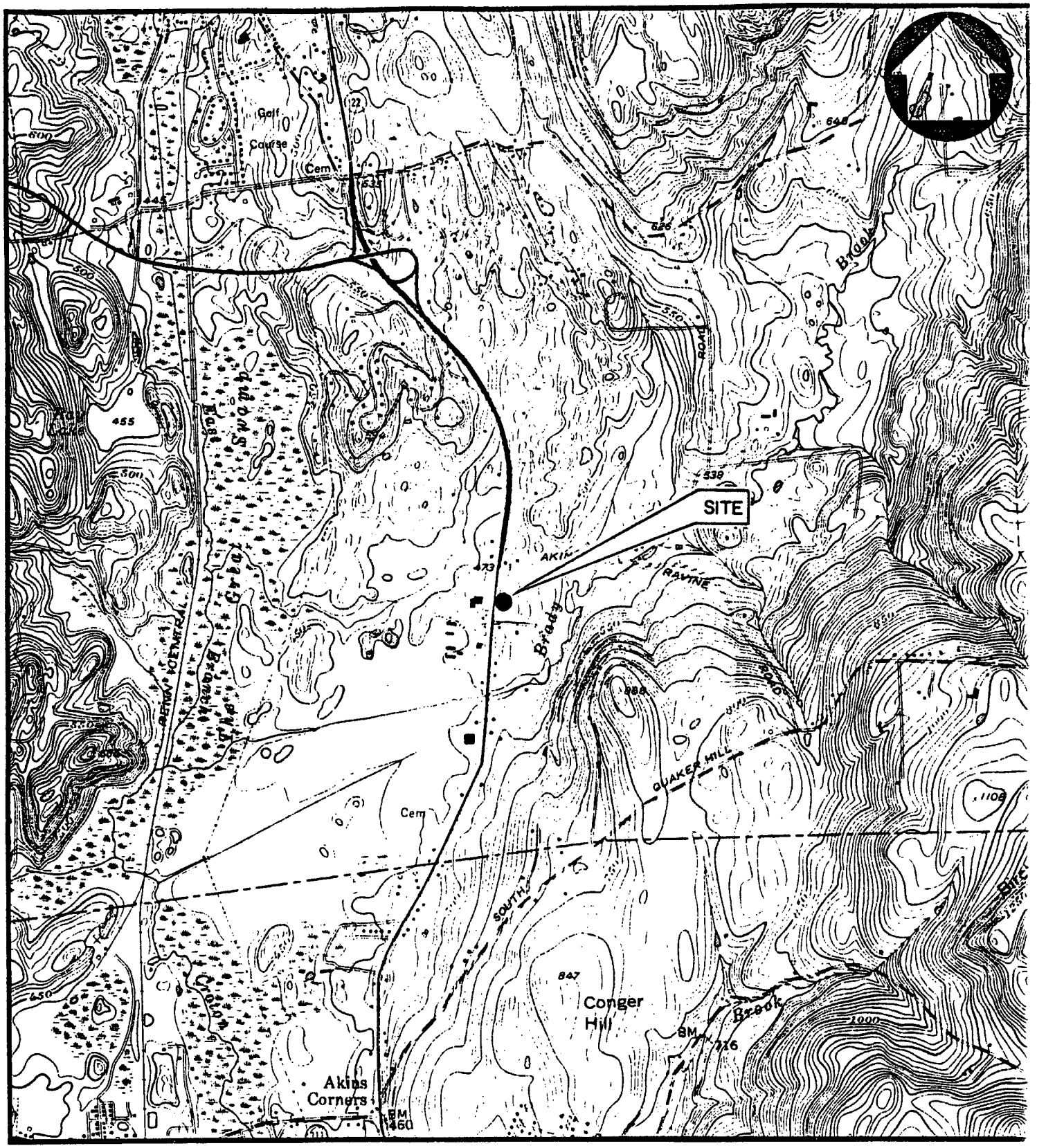
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Containment	1 3	1		3	7.1
2 Waste Characteristics					7.2
Direct Evidence	0 3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1 •		8	
Total Waste Characteristics Score				20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 3 4 5	1		5	
Distance to Nearest Building	0 1 2 3	1		3	
Distance to Sensitive Environment	0 1 2 3	1		3	
Land Use	0 1 2 3	1		3	
Population Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Buildings Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Total Targets Score				24	
4 Multiply 1 x 2 x 3				1,440	
5 Divide line 5 by 1,440 and multiply by 100	S_{FE} =				

DIRECT CONTACT WORK SHEET

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Incident	(0) 45	1	0	45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	0 1 2 (3)	1	3	3	8.2
3 Containment	0 (15)	1	15	15	8.3
4 Waste Characteristics Toxicity	0 1 (2) 3	5	10	15	8.4
5 Targets					8.5
Population Within a 1-Mile Radius	0 1 (2) 3 4 5	4	8	20	
Distance to a Critical Habitat	(0) 1 2 3	4	0	12	
Total Targets Score			8	32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			2,700	21,600	
7 Divide line 6 by 21,600 and multiply by 100	S_{OC} = 12.50				

TABLE OF CONTENTS

NYSDOT SPILL NO. 811902



SCALE: 1" - 2000'
TOPOGRAPHY TAKEN FROM
PAWLING, NEW YORK - CONN.
U.S.G.S. QUADRANGLE
1958
PHOTOREVISED 1971
AMS 6267 II SE - SERIES 821

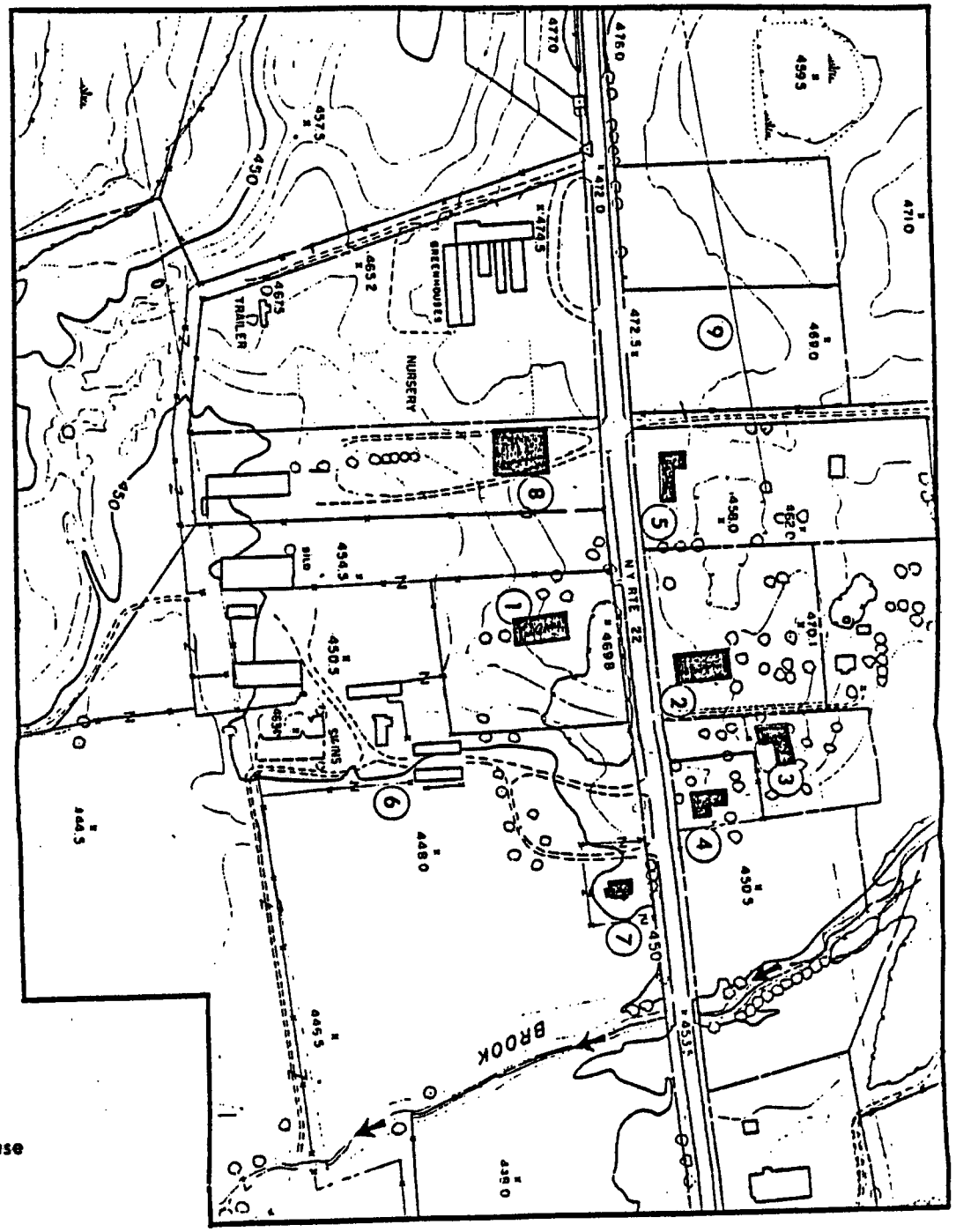
7.5 MIN. SERIES

QUADRANGLE
LOCATION

FIGURE 1

N.Y.S.D.O.T. SPILL NO. 811902

PAWLING, NEW YORK
N.T.S.
LAT. 41-32'-08"N LONG. 73-35'-08"W



1 Corral Ford
2 Surplus Store
3 Marios Pizza
4 Venezia Guest House
5 Amoco
6 Heinchon Dairy
7 Gold House
8 Stage Door Furniture
9 Burger King

SCALE: 1" - 200'

BASE MAP PROVIDED BY N.Y.S.D.O.T.
OIL SPILL ENGINEER.

DATE: 8/83

QUADRANGLE LOCATION

FIGURE 2

SITE SKETCH
N.Y.S.D.O.T. SPILL NO. 811902
PAWLING, NEW YORK

N.T.S.

2.0 PURPOSE

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This Phase I investigation was conducted under contract to the New York State Department of Environmental Conservation Superfund Program to evaluate the potential environmental or public health hazard associated with past disposal activities at the NYSDOT Spill No. 811092 site. Divided into two parts, this initial investigation consisted of a detailed file review of available information and an initial site investigation. The culmination of this phase is the development of a preliminary Hazard Ranking System (HRS) score.

Where information is lacking and a final score cannot be computed, recommendations will be made for a Phase II investigation designed to verify the assumptions made in the preliminary scoring and to collect the additional data needed to complete the site assessment.

3.0 SCOPE OF WORK

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To complete the preliminary HRS score for the NYSDOT Spill No. 811902 site, the following scope of work was conducted:

- A search of the following:
  - Available file information from federal, state, and municipal agencies
  - Published documents and maps from the U.S. Geological Survey, Soil Conservation Service and state agencies for geological, hydrological and topographical data
  - Available files, reports and drawings provided by site owners, operators and other knowledgeable parties.

- Interviews with individuals having knowledge of the site

Information searched includes well logs, land use data, water usage patterns, critical habitats and endangered species data, meteorological data, hydrological, geological and topographical data, waste characteristics and demographic information.

Following the initial record search, a site inspection was conducted. The intent of the inspection is to verify existing file information and to conduct an HNU survey to screen for potential air releases. Items of specific interest in the site investigation include:

- Overall site environmental conditions
- The presence of disturbed areas
- Visual signs of waste materials (drums, sludges, etc.)
- The occurrence of leachate
- Site topography

A detailed analysis was performed on all data collected in preparation of a preliminary HRS score. Where information was lacking and a final HRS score could not be computed, recommendations were made for a Phase II investigation. This investigation was designed to verify the assumptions made in the preliminary scoring and to collect the additional data needed to complete the site assessment. A summary of agencies contacted, contact person, address and information obtained follows.

SOURCES -- NYSDOT SPILL NO. 811902 SITE
(Page 1)

Name/Address/Phone	Type of Contact	Date	Information Provided
Mr. John Czapor, Environmental Engineer USEPA, Region II 26 Federal Plaza New York, New York 10278 (212) 264-1573	Letter Office Visit	1/3/86 1/14/86 1/24/86	USEPA file information
Mr. Richard D. Spear, Chief Surveillance & Monitoring Branch USEPA, Region II Woodbridge Avenue Edison, New Jersey 08817 (201) 321-6685	Letter	1/3/86	None available
Mr. Lawrence A. Martens, District Chief U.S. Department of the Interior U.S. Geological Survey Albany District Office P.O. Box 1669 U.S. Post Office and Court House Albany, New York 12201 (518) 472-3107	Letter Telephone Call	1/3/86	Roger Waller responded - list of available county groundwater reports
Mr. Paul Dodd, State Conservationist U.S. Department of Agriculture Soil Conservation Service 771 James M. Hanley Federal Building 100 South Clinton Street Syracuse, New York 13260 (315) 423-5521	Letter Telephone Call	1/3/86 1/13/86	Fred Gilbert responded - list of available county soil surveys
Mr. Carl B. Sciple, Division Engineer Army Corps of Engineers New England Division 424 Trapelo Road Waltham, Massachusetts 02154 (617) 894-2400	Letter	1/3/86	None available
Mr. Frederick J. Scullin, Jr. U.S. Department of Justice U.S. Attorney, Northern District of New York 369 Federal Building 100 South Clinton Street Syracuse, New York 13260 (315) 423-5165	Letter	1/3/86	Craig Benedict responded - No information available

SOURCES -- NYSDOT SPILL NO. 811902 SITE
(Page 2)

Name/Address/Phone	Type of Contact	Date	Information Provided
Mr. Conrad Simon, Director Air and Waste Management Division United States Environmental Protection Agency Region 2 26 Federal Plaza New York, New York 10278	Letter	1/24/86	None available
Mr. Marsden Chen, Supervisor Division of Solid and Hazardous Waste New York State Department of Environmental Conservation 50 Wolf Road Albany, New York 12233 (518) 457-0639	Office Visit	12/4/85	NYSDEC file information
Mr. Ronald Tramontano, P.E. Chief, Surveillance and Investigation Division Bureau of Toxic Substance Assessment Surveillance and Investigation Section Empire State Plaza Corning Tower, Room 372 Albany, New York 12237	Letter Office Visit	1/3/86 1/9/86	File information
Robert H. Fakundiny, State Geologist Geological Survey of New York State State Education Department Division of Museum Services Albany, New York 12230 (518) 474-5816	Letter	1/3/86	County Groundwater Reports
Mr. Robert Abrams, Attorney General New York State Attorney General Department of Law State Capitol, Room 221 Albany, New York 12224 (581) 474-7330	Letter	1/3/86	No information
Mr. Geoff Bornemann, Principal Planner Capital District Regional Planning Commission 251 River Street, Monument Square Troy, New York 12180 (518) 272-1414	Letter	1/3/86	Rocco Ferraro responded with list of contact persons for sites

SOURCES — NYSDOT SPILL NO. 811902 SITE
(Page 3)

Name/Address/Phone	Type of Contact	Date	Information Provided
Mr. Arthur Pasco Regional Administrative Officer NYSDOT Region 8 4 Burnett Boulevard Poughkeepsie, New York 12603	Letter Letter	1/3/86 1/28/86	Boring logs
New York State Department of Environmental Conservation 21 South Putt Corners Road New Paltz, New York 12561 (914) 255-5453	Office Visit	12/3/85	NYSDEC file information
Lucille P. Pattison County Executive Dutchess County 22 Market Street Poughkeepsie, New York 12601 (914) 431-2020	Letter	1/3/86	None available
William R. Steinhaus County Clerk Dutchess County 22 Market Street Poughkeepsie, New York 12601 (914) 431-2120	Letter	1/3/86	None available
Mr. Stephen J. Wing County Attorney Dutchess County 22 Market Street Poughkeepsie, New York 12601 (914) 431-2110	Letter	1/3/86	None available
Dr. John Scott Health Commissioner Dutchess County 22 Market Street Poughkeepsie, New York 12601 (914) 431-2015	Letter Office Visits	1/3/86	Background information
Mr. Roger A. Keley Planning Commissioner Dutchess County 47 Cannon Street Poughkeepsie, New York 12601 (914) 431-2480	Letter Telephone Call Office Visits	1/8/86 1/21/86 2/3/86	Natural Resources well logs, community water systems information

SOURCES -- NYSDOT SPILL NO. 811902 SITE
(Page 4)

Name/Address/Phone	Type of Contact	Date	Information Provided
Mr. James Spratt Public Works Commissioner Dutchess County 22 Market Street Poughkeepsie, New York 12601 (914) 431-2121	Letter Telephone Call	1/3/86 1/6/86	None available
Mr. Robert Vrana Solid Waste Management Dutchess County 22 Market Street Poughkeepsie, New York 12601 (914) 431-2115	Letter Telephone Call	1/3/86 1/6/86	None available
Soil and Water Conservation District P.O. Box 37 Farm & Home Center Millbrook, New York 12545 Attn: District Conservationist (914) 677-8011	Letter Letter	1/3/86 1/13/86	Irrigation practices County soil survey
Jay Maxwell, Sr. Route 22 Pawling, New York 12564	Personal Communication		Site access, site history
Sheryl Herrington Town Clerk Pawling, New York 12564 (914) 855-1122	Telephone Call	11/3/86	Village of Pawling water resources

4.0 SITE ASSESSMENT

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4.1 SITE HISTORY

The NYSDOT Spill No. 811902 site is located along Route 22 in the Village of Pawling, Dutchess County, New York. The site consists of five parcels of land, approximately 20 acres in size. A gasoline contaminated well at Corral Ford was reported by the Dutchess County Health Department on March 22, 1982. Additional water samples taken in the vicinity of the site resulted in the discovery of gasoline contaminated wells at Mario's Pizza, Maxwell Engine Rebuilders, Venezia's Guest House, and Heinchan Dairy. Activated carbon filters were supplied by NYSDOH for private wells in the area. These filters are still in use.

On March 31, 1983 the New York State Department of Transportation authorized Empire Soils Investigations, Inc. to perform a complete hydrogeologic study of the site. As part of the initial site assessment performed by Empire Soils Investigations, Inc., a total of 19 monitoring wells were installed in the project area. Results of chemical analyses performed on groundwater samples obtained on June 22-24, 1983 from the monitoring wells conclude that the major source of hydrocarbon contamination encountered in the project area to be the Amoco gas station located along Route 22. This station is owned by Cole Petroleum of 35 Market Street, Cold Springs, New York. Presently, Cole Petroleum has not responded to NYSDEC requests to initiate clean-up activities.

4.2 SITE TOPOGRAPHY

The NYSDOT Spill No. 811902 site is located along Route 22, approximately three-quarters of a mile north of the Putnam-Dutchess County border. The area is predominately commercial with several surrounding businesses within 500 feet. Drainage in the vicinity of the site is via Brady Brook, a New York State Class C brook. Brady Brook flows approximately one mile past the site and to the southwest before flowing into the Great Pattern Swamp, a NYSDEC unique and significant habitat area. The Great Swamp is drained by the East Branch of the Croton River. The Great Swamp surface is New York State Class C in the vicinity of the site.

Elevation at the site is approximately 470 feet MSL. Higher elevation exists to the north, east, and south. On site, slopes are to the southeast for approximately 1,000 feet, while overall slopes are to the south.

4.3 SITE HYDROGEOLOGY

Information obtained from Empire Soils Investigations, Inc. and Thomsen Associates report, Hydrogeologic Evaluations Oil Spill, Village of Pawling, Dutchess County, New York indicates the site lies within the Hudson Hills physiographic province of New York State, an area characterized by igneous and metamorphic bedrock. Bedrock underlying the site consists of units of the Orodovician age Stockbrdige formation. Monitoring wells installed by Empire Soils Investigations, Inc. indicates bedrock underlying the site ranges in depth from 15 to 30 feet and consists of gray to white dolomite marble. This marble is extensively fractured and slickensided (polished and striated). Voids, soil-filled seams, weak friable zones of variable extent were commonly encountered during diamond core drilling operations and are detailed on the hydrogeologic logs.

The overburden in this area consists of a horizon of stratified glacial outwash classified by the United States Department of Agriculture (1955) as members of the Merrimae soil series. These soils are predominantly interbedded sand and gravels and are considered to be very rapidly permeable.

Water level observations in the monitoring wells indicate the water table to be situated in close proximity to the bedrock surface. Water level data obtained from the monitoring wells on May 19, 1983 were used to contour the water table over the site. These readings indicate the major component of groundwater flows beneath the site to be southward, discharging to Brady Brook south of the site, with minor southwestward and southeastward flow components also apparent. Water level data obtained from the monitoring wells indicates a general vertical downward flow component between the overburden sand and gravel and carbonate bedrock, providing a mechanism for migration of contaminants through the relatively permeable unconsolidated deposits and into the underlying bedrock aquifer.

This mechanism operates independently of, but may be enhanced by, downward flow induced locally by drawdown in water supply wells. Therefore, it is assumed that the overburden sand and gravel aquifer and the carbonate bedrock aquifer are hydraulically connected.

4.4 SITE CONTAMINATION

Results of chemical analysis performed on groundwater samples obtained on June 22-24, 1983 downgradient of the site in Monitoring Wells B-3, B-11R, and B-16R indicate hydrocarbon contamination of groundwater where the presence of gasoline is confirmed. Lesser concentrations of hydrocarbon compounds were detected downgradient of the site in Monitoring Wells B-17, B-6, and B-18R, while the remaining samples contained less than one part per billion for each of the parameters analyzed. Analysis of groundwater samples from Monitoring Well B-14, upgradient of the Amoco station, indicate no contamination of groundwater by hydrocarbons at that point. These chemical analysis results, in conjunction with the groundwater flow beneath the site to be southward, indicate a hydrocarbon (gasoline) contamination plume emanating from the Amoco station located along Route 22 in the Village of Pawling.

Actions at the site are being handled by NYSDEC, under the Division of Water, Oil Spills Program. Cost Recovery is being handled by the Attorney General's Office.

5.0 PRELIMINARY APPLICATION OF THE HAZARD RANKING SYSTEM

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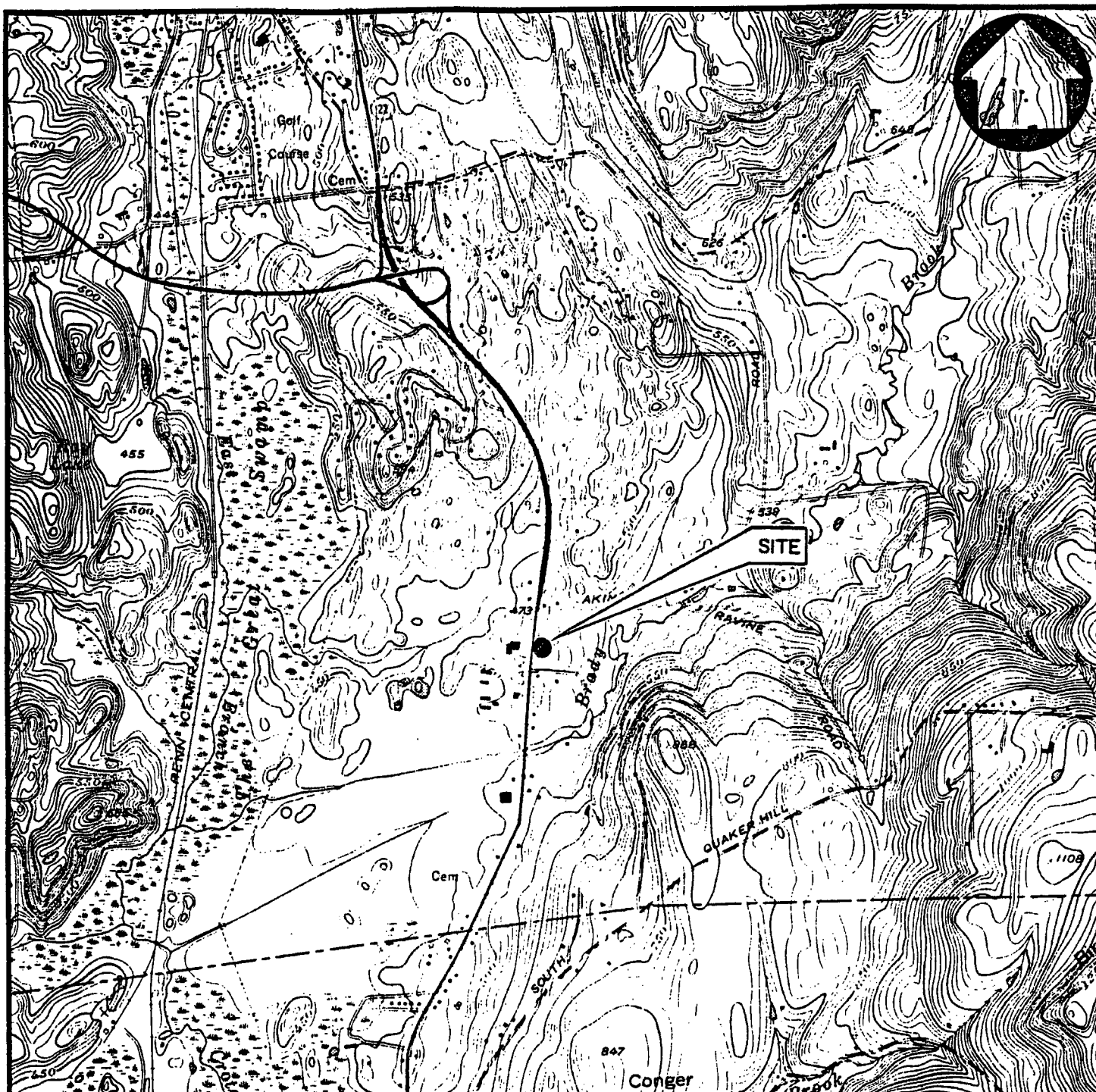
5.1 NARRATIVE SUMMARY

The NYSDOT Spill No. 811902 site is located along Route 22 in the Village of Pawling, Dutchess County, New York. The site consists of five parcels of land, approximately 20 acres in size. Groundwater in the vicinity of the site has been contaminated with petroleum hydrocarbons since the spring of 1982. Subsequent hydrogeologic investigations performed by Empire Soils Investigations, Inc. included the installation of 19 monitoring wells on site. Results of chemical analysis performed on groundwater samples obtained on June 22-24, 1983 from the monitoring wells conclude that the major source of hydrocarbon contamination encountered in the project area to be the Amoco gas station located along Route 22 in Pawling, New York. This gas station is owned by Cole Petroleum of Cold Springs, New York.

LOCATION



SCALE: 1" - 2000'
TOPOGRAPHY TAKEN FROM
PAWLING, NEW YORK - CONN.
U.S.G.S. QUADRANGLE
1958
PHOTOREVISED 1971
AMS 6267 II SE - SERIES 821
7.5 MIN. SERIES

QUADRANGLE LOCATION

FIGURE 1

N.Y.S.D.O.T. SPILL NO. 811902

PAWLING, NEW YORK

N.T.S.

LAT. 41-32'-08"N LONG. 73-35'-08"W

HRS DOCUMENTATION RECORDS

June 28, 1982

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

INSTRUCTIONS: The purpose of these records is to provide a convenient way to prepare an auditable record of the data and documentation used to apply the Hazard Ranking System to a given facility. As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference that will make the document used for a given data point easier to find. Include the location of the document and consider appending a copy of the relevant page(s) for ease in review.

FACILITY NAME: NYSDOT Spill No. 811902

LOCATION: Route 22, Pawling, New York

GROUND WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

Benzene
Toluene
M-xylene
O-xylene
Ethyl benzene

Score = 45

Source: References 1, 2

Rationale for attributing the contaminants to the facility:

Analysis of water samples taken from downgradient monitoring wells indicate hydrocarbon contamination in relation to samples taken from upgradient well exhibit no contamination.

Source: Reference 2

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifer(s) of concern:

There are two aquifers of concern at this site. They are the sand and gravel aquifer overlying the carbonate bedrock. According to Reference 2, the aquifers are hydraulically connected.

Source: References 2, 3, 10

Depth(s) from the ground surface to the highest seasonal level of the saturated zone (water table(s)) of the aquifer of concern:

Nineteen monitoring wells have been installed on site. Well depths vary from 11.75 to 38 feet. In the wells, reported water levels range from 10 feet to 19 feet.

Source: References 1, 2, 3

Depth from the ground surface to the lowest point of waste disposal/storage:

Depth of burial unknown; assume 6 feet. Depth of water table 10 feet. Distance between waste and water table 4 feet.

Source: References 1, 2, 5

Net Precipitation

Mean annual or seasonal precipitation (list months for seasonal):

44 inches

Source: Reference 5

Mean annual lake or seasonal evaporation (list months for seasonal):

28 inches

Source: Reference 5

Net precipitation (subtract the above figures):

16 inches

Score = 3

Source: Reference 5

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

The soil types are predominately interbedded sands and gravels and are considered very rapidly permeable.

Source: Reference 2

Permeability associated with soil type:

10^{-3} cm/sec.

Score = 3

Source: Reference 5

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

Gasoline spill
Liquid

Score = 3

Source: References 2, 3, 4

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Containers: groundwater data indicates tanks in leaking condition, no liner, no leachate collection system. No method of waste containment observed or documented.

Source: References 1, 2, 3, 4

Method with highest score:

No method of containment.

Score = 3

Source: References 1, 2, 3, 4

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Benzene
Ethyl benzene
Tetrachloroethylene
Toluene
M-xylene
O-xylene
Trichloroethylene
1,4-Dichlorobenzene
1,3-Dichlorobenzene
1,2-Dichlorobenzene

Source: References 2, 3, 4

Compound with highest score:

1,4-Dichlorobenzene = 15
Benzene = 12
Dichlorobenzene (NOS) = 18

Source: References 2, 3, 4

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

Total quantity of hazardous waste present unknown.

Score = 1

Source: References 1, 2, 3, 4

Basis of estimating and/or computing waste quantity:

No data exists for quantity of waste but analysis of water samples from monitoring wells confirm presence of gasoline.

Source: References 2, 3, 4

5 TARGETS

Ground Water Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Residential drinking water; no alternative unthreatened sources available.

Score = 3

Source: References 1, 2, 3, 4, 8

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

On site five supply wells draw from aquifer of concern.

Source: References 1, 2, 3, 4

Distance to above well or building:

On site; distance to well is zero.

Value = 4

Source: References 1, 2, 3, 4

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

One community well and one surface water intake, population served = 2,000. Rural population = 767 houses, population = 2,915.

Source: References 8, 9

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

No known irrigation occurs within three miles.

Value = 0

Source: Reference 11

Total population served by ground water within a 3-mile radius:

Community population = 2,000; private dwellings = 767 x 3.8 = 2,915; total population = 4,915

Score = 4

Matrix Score = 35

Source: References 8, 9

SURFACE WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

At this time, no observed release of contaminants to the surface water route has been reported although gasoline concentrations have been detected in on-site monitoring wells. Groundwater discharge to surface water may be occurring.

Score = 0

Source: References 1, 2, 3, 4

Rationale for attributing the contaminants to the facility:

Not applicable

2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

Up to 10 percent.

Source: Reference 1

Name/description of nearest downslope surface water:

Brady Brook within 1,000 feet of site.

Source: Reference 1

Average slope of terrain between facility and above-cited surface water body in percent:

Five to six percent.

Matrix Score = 3

Source: Reference 1

Is the facility located either totally or partially in surface water?

No

Score = 3

Source: Reference 1

Is the facility completely surrounded by areas of higher elevation?

No

Source: References 1, 2, 3, 4

1-Year 24-Hour Rainfall in Inches

2.5 inches

Score = 2

Source: Reference 5

Distance to Nearest Downslope Surface Water

Approximately 1,000 feet to nearest surface water.

Score = 3

Source: Reference 1

Physical State of Waste

Liquid

Score = 3

Source: References 2, 3, 4

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

No method of waste containment observed or documented.

Source: References 1, 2, 3, 4

Method with highest score:

No method of containment.

Score = 3

Source: References 1, 2, 3, 4

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Benzene
Ethyl benzene
Tetrachloroethylene
Toluene
M-xylene
O-xylene
Trichloroethylene
1,4-Dichlorobenzene
1,3-Dichlorobenzene
1,2-Dichlorobenzene

Source: References 2, 3, 4

Compound with highest score:

1,4-Dichlorobenzene = 15
Benzene = 12
Dichlorobenzene (NOS) = 18

Source: References 2, 3, 4

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum);

Total quantity of hazardous waste present unknown.

Score = 1

Source: References 1, 2, 3, 4

Basis of estimating and/or computing waste quantity:

No data exits for quantity of waste but analysis of water samples from monitoring wells confirm presence of gasoline.

Source: References 2, 3, 4

5 TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

Use of surface water within three miles downstream of the site includes fishing.

Score = 2

Source: Reference 6

Is there tidal influence?

No

Source: Reference 1

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

Not applicable

Source: Reference 1

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

A 50-60 acre wetland is located within three-quarter of a mile.

Score = 1

Source: Reference 1

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

There is no significant wildlife areas within one mile.

Score = 0

Source: Reference 7

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

No surface water intakes are located within the areas of concern.

Score = 0

Source: Reference 8

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

No known uses of surface water for irrigation have been identified.

Source: Reference 11

Total population served:

No known uses of surface water have been identified.

Source: Reference 8

Name/description of nearest of above water bodies:

Brady Brook within 1,000 feet of site.

Source: Reference 1

Distance to above-cited intakes, measured in stream miles:

No surface water intakes have been identified.

Source: Reference 8

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected:

To score an air release, qualitative air sampling is required along with details on the sampling protocol and the meteorological conditions during the time of sampling. No qualitative air sampling has been performed.

Score = 0

Source: Reference 1 and File Review

Date and location of detection of contaminants:

Not applicable

Methods used to detect the contaminants:

Not applicable

Rationale for attributing the contaminants to the site:

Not applicable

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Not applicable

Most incompatible pair of compounds:

Not applicable

Toxicity

Most toxic compound:

Not applicable

Hazardous Waste Quantity

Total quantity of hazardous waste:

Not applicable

Basis of estimating and/or computing waste quantity:

Not applicable

3 TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi **0 to 1 mi** **0 to 1/2 mi** **0 to 1/4 mi**

Not applicable

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

Not applicable

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

Not applicable

Distance to critical habitat of an endangered species, if 1 mile or less:

Not applicable

Land Use

Distance to commercial/industrial area, if 1 mile or less:

Not applicable

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

Not applicable

Distance to residential area, if 2 miles or less:

Not applicable

Distance to agricultural land in production within past 5 years, if 1 mile or less:

Not applicable

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

Not applicable

Is a historic or landmark site (National Register of Historic Places and National Natural Landmarks) within the view of the site?

Not applicable

FIRE AND EXPLOSION

1 CONTAINMENT

Hazardous substances present:

To score the fire and explosion hazard mode either a state or local fire marshall must have certified that the facility presents a significant fire or explosion threat to the public or to a sensitive environment, or there must be a demonstrated threat based on field observations (e.g. combustible gas indicator readings). The available records give no indication that either one of these tasks has been done. Further, the available data do not suggest any imminent threat of fire and explosion at this site. Therefore the route score cannot be completed.

Source: Reference 1 and File Review

Type of containment, if applicable:

Not applicable

2 WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

Not applicable

Ignitability

Compound used:

Not applicable

Reactivity

Most reactive compound:

Not applicable

Incompatibility

Most incompatible pair of compounds:

Not applicable

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

Not applicable

Basis of estimating and/or computing waste quantity:

Not applicable

3 TARGETS

Distance to Nearest Population

Not applicable

Distance to Nearest Building

Not applicable

Distance to Sensitive Environment

Distance to wetlands:

Not applicable

Distance to critical habitat

Not applicable

Land Use

Distance to commercial/industrial area, if 1 mile or less:

Not applicable

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

Not applicable

Distance to residential area, if 2 miles or less:

Not applicable

Distance to agricultural land in production within past 5 years, if 1 mile or less:

Not applicable

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

Not applicable

Is a historic or landmark site (National Register of Historic Places and National Natural Landmarks) within the view of the site?

Not applicable

Population Within 2-Mile Radius

Not applicable

Buildings Within 2-Mile Radius

Not applicable

DIRECT CONTACT

1 OBSERVED INCIDENT

Date, location, and pertinent details of incident:

There has been no confirmed incident in which direct contact with hazardous waste has been observed or documented.

Score = 0

Source: Reference 1

2 ACCESSIBILITY

Describe type of barrier(s):

No barriers are present and there are no restrictions to site access.

Score = 3

Source: Reference 1

3 CONTAINMENT

Type of containment, if applicable:

No evidence of containment measures has been found during site investigation or file review.

Score = 15

Source: Reference 1

4 WASTE CHARACTERISTICS

Toxicity

Compounds evaluated:

Benzene
Ethylbenzene
Toluene
Tetrachloroethylene
M-xylene
O-xylene

Source: References 1, 2

Compound with highest score:

Benzene

Score = 2

Source: Reference

5 TARGETS

Population within one-mile radius

Within one mile radius, population = 403

Score = 2

Source: House Count, USGS Pawling, New York Quadrangle

Distance to critical habitat (of endangered species)

There are no critical habitats within one mile.

Score = 0

Source: Reference 7

WEHRAN ENGINEERS & SCIENTISTS
666 EAST MAIN STREET
P.O. BOX 2006
MIDDLETOWN, NY 10940

Reference 1.1

WEHRAN ENGINEERING - SITE INSPECTION FORM

1. IDENTIFICATION

NYSDOT Spill No. 811902	Dutchess
Site Name	County
314060	Region III
NY Number	NYSDEC Region

2. LOCATION

Route 22	
Street/Route No.	Town
	Pawling
City	Village
Pawling	
USGS Quadrangle	

3. INSPECTION

1/8/86	1:00 P.M.
Date of Inspection	Time of Inspection

clear, 20°, Cold
Weather Conditions and Snow Cover

WE Inspectors (Name)	Title	Phone Number
David B. Tompkins	Environmental Scientist	(914) 343-0660
Stephen Petrisko	Environmental Scientist	(914) 343-0660

Other Inspectors (Name)	Affiliation	Phone Number

Site Reps. Interviewed	Affiliation	Phone Number
Mr. Jay Maxwell, Sr.	Resident	
Mr. Jay Maxwell, Jr.	Resident	

4. SITE DESCRIPTION

4.1 Site History

Active x Inactive ____

Years of Operation: Unknown

Owner(s): Uknown

4.2 Storage/Disposal (Check all that apply)

			Size/Amount	Unit of Measure
__	A.	Surface Impoundment		
__	B.	Piles		
__	C.	Drums, Above Ground		
__	D.	Tank, Above Ground		
x	E.	Tank, Below Ground		
__	F.	Landfill		
__	G.	Landfarm		
__	H.	Open Dump		
x	I.	Spill		
__	J.	Well Field		
__	K.	Other (_____)		

4.3 Treatment (Check all that apply)

__	A. Burning	__	E. Waste Oil Processing
__	B. Incineration	__	F. Solvent Recovery
__	C. Underground Injection	__	G. Other Recycling/Recovery
__	D. Chemical/Physical/Biological	__	H. Other (_____)

4.4 Waste Substances Observed (include hazardous)

Benzene, Toluene, Xylene, Ethyl benzene, Tetrachloroethylene

4.5 Containment of Wastes (describe)

None

4.6 Accessibility of Public to Wastes (describe)

No method of containment observed

5. ENVIRONMENTAL MEASUREMENTS (DURING INSPECTION)

5.1 HNU/OVA Readings (Note locations on site sketch)

Location	Value (ppm)	Classification
Background		

Method/Instrument:

5.2 Site Topography (Describe relative to regional features)

Commercial area, located in the valley of the East branch river.

5.3 Site Slope (percent) up to 10%

	Reading (Percent)
Read from highest disposal area surface to edge of disposal area.	
If disposal area is within enclosed basin, report as zero.	
Average	

5.4 Prevailing Direction of Site Slope Southward to Southwestward

5.5 Distance to Nearest Downslope Surface Waters (from edge of disposal area)

Name/Description	Distance	Units	Permanent/Intermittent
Tributary to	1,000	ft	
east branch of the			
Croton River.			

5.6 Intervening Terrain Slope to Nearest Downslope Waters (from edge of disposal area)

Name/Description	Reading (Percent)
Tributary to east branch of the Croton River (Brady Brook)	5-6%

5.7 Distance to Nearest Downslope Wetlands (5-acre minimum)

Size (Acres)	Distance	Units
min. 25 acres	3/4	mi

5.8 Distance to Critical Habitat (endangered species)

Name/Location	Distance	Units
N/A		

5.9 Observed Site Geology (Describe from visual observations)

Overburden (soils)	Unknown
Bedrock	Unknown
Depth to Rock	Unknown

5.10 Distance to Nearest Potable Well (Identify on topographic map)

Type (Private/Community/Municipal)	Distance	Units
Private	on-site	

5.11 Distance to Nearest Off-Site Building

Within one-half miles.

5.12 Describe Source and Use of Water on Site

Drinking Water

6.0 LAND USE

6.1 Distance to Nearest:

Residential Area	_____ miles
Commercial/Industrial	Adjacent miles
Recreation Use	_____ miles
Forest	_____ miles
Wildlife Reserve	_____ miles
Historic/Landmark Site	_____ miles
Prime Agricultural Land	_____ miles
Agricultural Land	_____ miles

7.0 SITE EVALUATION

7.1 Landfills/Open Dumps/Piles (Use N/A if not applicable) N/A

Adequacy of Cover: _____

Adequacy of Runoff Diversion: _____

Potential/Observed Ponding: _____

Waste Piles Stabilized/Unstabilized: _____

Permeability/Compatibility of Liner: _____

Observed Seeps: _____

Adequacy of Leachate Collection: _____

Adequacy of Run-On Controls: _____

7.2 Surface Impoundments Size/Capacity

Adequacy of Diking/Diversion Structures: _____

Adequacy of Freeboard: _____

Potential/Observed Leaking: _____

Permeability/Compatibility of Liner: _____

Adequacy of Run-On Control: _____

Adequacy of Leachate Collection System: _____

7.3 Containers

Number and Type of Containers Observed: _____

Container Condition: _____

Observed Leaking (during inspection): _____

Evidence of Previous Ground Spills: Suspected evidence of previous spills

Evidence of Underground Tank Leaking: Suspected

Adequacy of Containment/Diversion Structures: _____

8.0 MONITORING/OBSERVATION WELLS

8.1 Number of On-Site Wells: 19

Diameter and Materials: Two inches PVC

8.2 Number of Off-Site Wells: _____

Diameter and Materials _____

8.3 Well Identification and Inspection (Include on-site sketch) (See next page)

Well No.	Location/ Gradient	Total Depth	Screen Interval	Water Level (ft)[1] Top of Water	-	Stickup	=	Depth to Water
					-		=	
					-		=	
					-		=	
					-		=	
					-		=	
					-		=	
					-		=	
					-		=	
					-		=	

[1]Measurements taken during site inspection to accuracy of 0.01 ft.

8.4 Water Level Instrument/Method:

Electric Probe

8.5 Condition of Wells/Seals:

Good

8.6 Well Records (from site owner, operator, or contractor)

Wells Installed by (Driller): Empire Soils Investigations

Installed for: Empire Soils and Thomsen Associates

Tested by (lab): Camo Labs, Galson Technical Services

Data Obtained by WE (yes/no): Yes

Boring Logs Obtained by WE (yes/no): Yes

8.7 Headspace HNU/OVA Readings

Well No.	Reading (ppm)	Classification
Background		

9. COMMENTS AND INTERVIEW NOTES (IDENTIFY SOURCES)

Ref. 2:1

EMPIRE
SOILS INVESTIGATIONS INC.

HYDROGEOLOGIC EVALUATIONS
OIL SPILL
VILLAGE OF PAWLING
DUTCHESS COUNTY, NEW YORK

SPILL NO. 811902
P.I.N. SP 1633.701

for

NEW YORK STATE
DEPARTMENT OF TRANSPORTATION
OIL SPILL PREVENTION & CONTROL BUREAU

and

NEW YORK STATE
DEPARTMENT OF TRANSPORTATION
REGION NO. 8

JOHN SCHAFF
Assistant Regional Oil Spill Engineer

prepared by

EMPIRE SOILS INVESTIGATIONS, INC.
&
THOMSEN ASSOCIATES

File No. GTA-82-17J
October 1983

635 JAMES ST., SYRACUSE, NY 13203 (315) 472-9333

THOMSEN ASSOCIATES

October 24, 1983

New York State Department
of Transportation
4 Burnett Boulevard
Poughkeepsie, New York 12603

Attention: John Schaff
Assistant Regional Oil Spill Engineer

Reference: Hydrogeologic Evaluations
Hydrocarbon Spill
Pawling, Dutchess County, New York
Spill No. 811902
P.I.N. SP 1633.701

Gentlemen:

Enclosed please find three (3) copies of our report of findings prepared in connection with the referenced hydrocarbon spill.

This report presents the results of work performed on this project by Empire-Thomsen through August 31, 1983. The information contained in this report incorporates and supersedes our previously submitted correspondence.

The findings of this study indicate the major source of hydrocarbon contamination encountered in the monitoring wells in the project area to be the Amoco station on NYS Route 22. Observations during the course of this study show this contamination to be primarily dissolved hydrocarbon compounds; no measureable free product has been noted at any of the data points in the area.

This study was intentionally restricted to the upper portions of the local aquifer in efforts to determine the apparent source area(s) of hydrocarbon contamination. However, for spill remediation purposes the need to visualize this contamination problem in three dimensions cannot be overstressed. In addition to the presence of hydrocarbons in the upper zone of the aquifer, volatile contaminants are found in groundwater at depths indicating their vertical migration due to pumping from deep water supply wells. In the absence of construction details of these supply wells, or a deep groundwater quality monitoring network,

THOMSEN ASSOCIATES

the full extent and severity of the vertical component of contamination cannot presently be defined. Accordingly, appropriate additional work as outlined in the Recommendations section of this report is strongly urged to resolve this problem.

In terms of spill remediation a coordinated approach, involving elimination of source(s) of contaminant input as well as the mechanisms of vertical contaminant migration within the aquifer, is recommended. Subsequent to implementation of such actions ongoing assessment of local groundwater quality by means of periodic sampling from the monitoring wells is warranted, as detailed in the report.

Should you have any questions or comments regarding the contents of this report, please feel free to contact our office.

We appreciate the opportunity to assist your office with this investigation, and we look forward to working with you on future projects.

Respectfully submitted,

THOMSEN ASSOCIATES
&
EMPIRE SOILS INVESTIGATIONS, INC.

Ronald Ausburn SDR

Ronald Ausburn, CPGS
Project Manager

Marjory B. Rinaldo-Lee, CPGS
Senior Hydrogeologist
(Reviewer)

TABLE OF CONTENTS

SECTION 1

INTRODUCTION

1.1 PROJECT INITIATION

1.1.1 This report presents the results of ongoing studies by Empire Soils Investigations, Inc. and its affiliated geotechnical consultant, Thomsen Associates, related to hydrocarbon contamination of groundwater in the vicinity of the village of Pawling, Dutchess County, New York. This particular phase of study was authorized by the office of the New York State Department of Transportation (NYSDOT) Regional Oil Spill Engineer (ROSE) on March 31, 1983, and was completed under the auspices of an Agreement (Contract D200165) between the NYSDOT Oil Spill Prevention and Control Bureau and Empire Soils Investigations, Inc., pertaining to hydrogeologic investigations at oil spill sites.

1.1.2 Personnel involved in this study included the Assistant Regional Oil Spill Engineer for NYSDOT Region 8, John Schaff; Ronald Ausburn, CPGS, engineering geologist and project manager for Thomsen Associates; and Stephen Rossello, hydrogeologist with Thomsen Associates.

1.1.3 General aspects of the field exploration program dealt with herein, including specifications and locations for test borings and groundwater monitors, were agreed upon by the office of the Regional Oil Spill Engineer and Thomsen Associates prior to initiation of such work. Specific material sampling and monitor installation details were as dictated by the actual field conditions encountered. Exploratory drilling and monitoring well installations were performed by personnel and equipment from the Groton, New York operations office of Empire Soils Investigations, Inc.

Necessary site survey work was performed by Thomsen Associates personnel. For the purposes of this report, all elevations are referenced to an assumed datum of 100.0 feet at the benchmark location shown on drawings attached hereto.

1.2 PROJECT OBJECTIVE AND SCOPE

1.2.1 The goal of this investigation was to determine both the source area(s) and areal extent of hydrocarbon contamination documented by the Regional Oil Spill Engineer in several water supply wells in the project area. The supply wells involved are those serving Corral Ford, Marios Pizza, Heinchon Dairy and Hawkey's Surplus Store. If feasible, the site-specific data obtained in the process of meeting these objectives was to be utilized for formulation of general replacement supply well parameters and contamination abatement alternatives.

1.2.2 As formally authorized by the office of the Regional Oil Spill Engineer, Empire Soils Investigations, Inc./Thomsen Associates were to complete subsurface investigations and hydrogeologic analyses required to satisfy project objectives. Results of such studies, including recommendations for any supplemental work deemed adviseable, were to be presented in a report submitted to the Regional Oil Spill Engineer.

1.2.3 Of concern to both the office of the Regional Oil Spill Engineer and Thomsen Associates during all phases of this investigation was the potential for vertical contaminant migration, via the exploratory boreholes, within the local aquifer. To minimize the possibility of such cross contamination, the scope of services provided by Empire Soils Investigations, Inc./Thomsen Associates included the formulation and use of specialized, site-specific drilling procedures as described in Section 2, Investigative Methodology.

1.2.4 As specifically directed by the Regional Oil Spill Engineer, use of construction details, water level data and chemical analysis results for local water supply wells, and access to these wells, was to be of limited extent in this phase of study. An additional NYSDOT-mandated limitation in this investigation included restriction of exploratory work to the uppermost zones of the local aquifer and bedrock.

1.3 PREVIOUS WORK

1.3.1 Initial hydrogeologic evaluations at this site were performed by Thomsen Associates in January 1983 and included limited assessment of the character of local unconsolidated deposits by means of shallow test borings and monitoring wells. Results of this study were furnished to the Regional Oil Spill Engineer in a preliminary report dated January 20, 1983 (Empire Soils Investigations, Inc. 1983a). Pursuant to directives from the Regional Oil Spill Engineer, no investigations of the local bedrock aquifer or contaminated water supply wells were performed at that time.

1.3.2 In March 1983, selected contaminated water supply wells in the project area, designated by the Regional Oil Spill Engineer, were investigated for presence of free hydrocarbon in the well bore itself by means of a water level probe inserted in the well. At that time, water levels were determined in these wells and were utilized to contour the water table. These findings were presented to the Regional Oil Spill Engineer in a report submitted March 10, 1983 (Empire Soils Investigations, Inc., 1983b).

1.3.3 Findings of these initial phases of work by Thomsen Associates are incorporated in, and superseded by, this report.

1.4 POTENTIAL HYDROCARBON SOURCES

1.4.1 Potential hydrocarbon sources considered in this investigation include an active Amoco service station; vehicle maintenance facilities at an active auto dealership; motor cleaning and repair facilities at Maxwell Engine Rebuilders; buried storage tanks at a florist shop, and buried fuel tanks at Heinchon Dairy. All of these potential contaminant sources are situated within the limits of the area studied, as shown on Drawing 3 of Appendix A.

1.4.2 Potential hydrocarbon contamination associated with vehicle traffic and parking areas was also considered in these evaluations.

1.5 SUPPLY WELL INVENTORY

1.5.1 In general, water supply wells in the study area are cased through unconsolidated materials and extend into bedrock to variable depths in excess of 100 feet (Schaff, 1982).

SECTION 2

INVESTIGATIVE METHODOLOGY

2.1 SUBSURFACE INVESTIGATIONS

2.1.1 As part of the initial site assessment (Empire Soils Investigations, Inc., 1983a), a total of nine boreholes, numbered 1 through 9, were advanced through unconsolidated deposits in the project area. Those boreholes encountering free groundwater, numbers 3 and 6, were converted to permanent groundwater monitors via the installation of PVC wellscreen and riser. For reference purposes the Subsurface Logs for these test holes are included in Appendix B. Note that due to the limited scope of investigation at that time, most boreholes were terminated upon encountering auger "refusal". In the absence of diamond core drilling, such refusal is interpreted as indicating the presence of boulders or bedrock.

2.1.2 Ongoing studies detailed in this report consisted of the placement of seventeen additional monitoring wells in the project area in the period April 27 through May 12, 1983. These new installations were numbered B-8 and B-10 through B-19 inclusive; borehole B-8 was made at the same location as test boring number 8 of January 1983 and retains that designation. Monitors B-8, B-10, B-11, B-14, B-16 and B-18 consist of multiple installations (monitor clusters) constructed to facilitate discrete groundwater sampling at various depths within the aquifer, as well as assessment of hydraulic relationships between overburden and bedrock. In these multiple installations the designation "R" is used to indicate the monitor screened in rock.

2.1.3 Each monitoring well is constructed of flush-threaded, machine slotted nominal two inch diameter PVC wellscreen and riser, with teflon tape used in all joints. The screened interval of monitors placed in unconsolidated (overburden) material extends above the water table, permitting entry into the well casing of any free hydrocarbon which may be floating upon the water table. Monitoring wells extending into bedrock are screened at various intervals which reflect the character of the bedrock at each specific well location. Construction details of specific monitors are indicated on the appropriate Subsurface and Hydrogeologic Logs in Appendix B.

2.1.4 Due to mechanical and size restrictions inherent in the drilling procedures used, monitor clusters were constructed in separate boreholes situated in close proximity to one another to facilitate sampling of discrete depth intervals at one location within the aquifer. This methodology was also selected over the alternative procedure of multiple-well installations in a single borehole to minimize the potential for cross-contamination. At locations where monitor clusters were installed the deeper bedrock monitor was completed first. To install the bedrock monitor, a pilot hole was drilled through overburden using hydraulically advanced hollow stem auger casing. When the apparent surface of "sound" bedrock was reached the augers were withdrawn and flush threaded pipe casing was spun into the pilot hole and seated approximately 3 to 6 inches into hard rock. Bedrock was core drilled within the casing and the monitoring well subsequently installed. A bentonite seal was placed within the casing at the soil-rock interface and the pipe casing was then withdrawn. With subsurface conditions at each well location thus defined, overburden monitors were installed to appropriate depths immediately adjacent to the deep wells.

2.1.5 As indicated on the test boring logs, split barrel samples (American Society for Testing and Materials, 1983a) were obtained in overburden in selected test borings to define the local soil profile. Diamond core drilling (American Society for Testing and Materials, 1983b) was performed in the upper portions of the bedrock horizon at various locations in the project area to obtain data on rock type, structure and character.

2.1.6 All recovered soil and rock samples were described by the on-site geologist and field foreman during operations. Following completion of field study, samples were forwarded to laboratory facilities where they were visually examined and described in greater detail by an engineering geologist, and final Subsurface and Hydrogeologic Logs (Appendix B) were prepared. Overburden samples were classified in general accordance with the Unified Soil Classification System (see Appendix B, "Key to Hydrogeologic Logs"). Rock core was also logged in detail in the laboratory (American Institute of Professional Geologists, 1977).

2.1.7 Grain size analyses were performed on representative split barrel samples to confirm the visual classifications and provide data on the grain size distribution of the overburden deposits. Results of these analyses are included as Appendix D.

2.2 HYDROGEOLOGIC DATA

2.2.1 On May 10, 1983, field permeability or "slug" tests (Bouwer and Rice, 1976) were performed in monitoring wells screened in overburden (B-3, B-10, B-16 and B-18); these tests included both rising head and falling head tests. On that same date, constant head tests (United States Department of the Interior, 1977) were performed in bedrock monitors B-8R

and B-12R, which reflect the extremes in rock quality noted in the boreholes. Results of these tests are discussed further in Section 3, Findings of Investigations.

2.2.2 Water levels in the monitoring wells and selected supply wells at the site were determined by Thomsen Associates personnel on various dates through the use of an electric well probe. Concurrently, the monitoring wells were investigated for the possible presence of free product by means of a transparent surface sampler. Water level data is summarized in tabular form in Appendix C.

2.3 GEOCHEMICAL DATA

2.3.1 On June 22-24, 1983, groundwater samples and water levels were obtained from monitoring wells in the project area by Camo Laboratories, Poughkeepsie, New York. In addition to samples of standing ("stagnant") water from the wells, these samples included "regenerated" water samples obtained following evacuation of five volumes of water from the wells. All samples were analyzed by Camo Laboratories for NYSDOT 602 aromatic hydrocarbons, and results of these analyses are presented in Appendix E. This appendix contains pertinent portions of a detailed analytical report prepared by Camo Laboratories for the ROSE and furnished to Thomsen Associates by the NYSDOT Oil Spill Engineer.

SECTION 3

FINDINGS OF INVESTIGATIONS

3.1 SITE LOCATION

3.1.1 The project area is located in southeastern Dutchess County, New York, approximately 19 miles southeast of the city of Poughkeepsie, New York and 18 miles northwest of Danbury, Connecticut. The site is found on the Pawling, New York/ Connecticut USGS 7.5 minute topographic quadrangle, as indicated on Drawing No. 1, Site Location Map, in Appendix A.

3.1.2 This site is situated in the valley of the East Branch of the Croton River, which flows south through Putnam and Westchester Counties to a confluence with the Hudson River. Elevations on the valley floor in the area range from approximately 430 to 450 feet above mean sea level; uplands marginal to the valley form scarps rising rapidly to elevations of 850 feet or more above mean sea level.

3.2 GENERAL LOCAL GEOLOGY

3.2.1 The site lies within the Hudson Hills physiographic province of New York State, an area characterized by igneous and metamorphic bedrock, drainage controlled by the Hudson River, and narrow steep-walled valleys (Thompson, 1966). These valleys generally reflect local bedrock structures, being developed along zones of bedrock faults and folds which trend regionally to the northeast (New York State Museum and Science Services, 1962). Valley floors are relatively level, underlain by limestone and filled with glacial drift, while uplands consist of resistant crystalline rocks (Simmons, et.al., 1961).

3.2.2 Unconsolidated deposits in the project area consist of a horizon of stratified glacial outwash classified by the United States Department of Agriculture (1955) as members of the Merrimac soil series. These soils are predominantly interbedded sands and gravels, deep to bedrock, and are considered generically "very rapidly permeable". Glacial outwash deposits comprise the most productive unconsolidated aquifer in Dutchess County (Simmons, et.al., 1961).

3.2.3 Local bedrock consists of units of the Orodovician-age Stockbridge Formation (New York State Museum and Science Service, 1970). In northwestern Dutchess County these units are essentially undisturbed dolomitic limestone (magnesium-calcium carbonate). Southeastward across the county, however, the deformation and metamorphism of these units, related to the Taconic Orogeny, intensifies to the extent that the limestones have been totally metamorphosed and recrystallized to dolomitic marbles. Impure, friable (crumbly) sandy interbeds are commonly noted within the limestone and marble. The Stockbridge Formation is the major bedrock aquifer in Dutchess County and ranges from approximately 1000 to 3000 feet in thickness in the county (Simmons, et.al., 1961).

3.2.4 The East Branch of the Croton River occupies a topographic feature, referred to as the Harlem Valley, which is actually the surface expression of underlying bedrock structure. Based upon detailed fieldwork, Balk (1936) concluded that the Harlem Valley represents an anticline (upfold), the limbs of which are defined by scarps of crystalline rock and the core of which is composed of marble. Differential weathering, i.e., more rapid weathering and erosion of the weaker carbonate bedrock in the center of the anticline, accounts in large part for the topography presently observed.

3.2.5 Locally, bedrock structure is extremely complex; both normal and thrust faults are common as are overturned folds and belts or zones of "plastic deformation" (Balk, 1936). As a result of this deformation, the orientation of features critical to groundwater flow through bedrock, such as bedding planes and fractures ("secondary permeability") varies significantly over short distances.

3.2.6 The variation in orientation of secondary permeability features is further complicated by incipient karst (sinkhole) topography developed in the readily-weathered marble (Simmons, et.al., 1961). Through time, groundwater flow through secondary channels has resulted in solution, erosion and enlargement of these features into interconnected, open or sand-filled cavities and conduits within the rock. In addition to such solution activity along planar features, differential weathering of poorly-cemented and/or relatively more permeable strata within the rock mass is also extensive, as is apparent from inspection of outcrops in the vicinity of the project area.

3.3 SITE SPECIFIC GEOLOGY

3.3.1 As shown on Drawing 2, Vicinity Map, the site occupies a stretch of terrain along New York State Route 22, which in the project area is itself situated on a ridge rising slowly to the north. Ground slopes moderately to the southwest and southeast from the central portion of the site toward Brady Brook, a tributary of the East Branch of the Croton River. Overall topographic relief in the study area is on the order of twenty-five feet.

3.3.2 As indicated on the test boring logs (Appendix B) the boreholes completed for this investigation penetrated surficial fill materials underlain by granular glacial outwash consisting of loose to firm, interbedded sands and gravels. Results of grain size analyses performed on representative samples recovered from various locations and depths within this horizon (Appendix D) indicate these sediments to be largely fine to coarse sand with variable percentages of gravel and generally twenty percent or less of "fine" material (silt and clay).

3.3.3 Compact glacial till was noted beneath the outwash horizon in several test borings. However, this till layer is thin and discontinuous, and in most areas of the site the granular outwash deposits were seen to directly overlie bedrock.

3.3.4 In several test borings (B-11, B-13, B-16 and B-17), subsurface conditions and the limited sampling program undertaken made delineation of the bedrock surface in those areas difficult. Immediately overlying hard bedrock in these boreholes is a zone which may represent glacial till, "nested" boulders in outwash, severely to completely weathered bedrock (saprolite) or, in some instances, solution breccia related to collapse of cavities in bedrock. Although generally three to four feet in thickness, this zone appears to be in excess of ten feet thick in some portions of the site (B-16 and B-17) and, in these areas, is believed to represent saprolite or collapsed rock (see section 3.3.6).

3.3.5 Bedrock underlies the project area at depths ranging from fifteen to thirty feet in the boreholes and consists of gray to white dolomitic marble. This marble is extensively jointed (fractured), and slickensided (polished and striated) fracture surfaces attest to folding and faulting of the rock. Voids, soil-filled seams and weak, friable zones of variable extent were commonly encountered during diamond core drilling operations and are detailed on the Hydrogeologic Logs. Also shown on the test boring logs are the core recovery ratios and RQD (Rock Quality Designation) in each borehole. These figures range from 90 percent or better in boreholes B-8, B-10, and B-13 in which they are indicative of excellent quality, relatively sound rock (American Institute of Professional Geologists, 1977) to 50 percent or less in test holes B-12 and B-18, values characteristic of poor quality rock. This range in RQD values illustrates the wide variation in bedrock quality over the area. The detailed descriptions on the Hydrogeologic Logs also reflect the vertical irregularities common in the bedrock which result from selective weathering, with hard, sound zones found interbedded with extremely weathered strata.

3.3.6 Comparison of site plans (Drawings 1, 2 and 3) with the results of the rock coring performed for this study suggests correlation between bedrock quality and several topographic depressions in the project area, aligned immediately east of Route 22. Several of the boreholes which reflect complex or uncertain subsurface conditions and poor bedrock quality (B-12, B-16, B-17 and B-18) are situated within, peripheral to, or along the alignment of these depressions, which are themselves believed to be areas of subsidence (sinkholes) over concealed bedrock structure or weak, poor-quality rock.

3.3.7 Based upon test boring data, an interpretation of the general configuration of the bedrock surface is presented as Drawing No. 4 in Appendix A. The contours inferred for the concealed bedrock surface indicate a bedrock "high" immediately south of the Amoco station, with the rock surface sloping moderately to the northeast, south and southwest. The inferred presence of concealed bedrock structure(s) near borehole B-17 is illustrated on Drawing 4 by the depression contour around that point.

3.4 LOCAL HYDROGEOLOGIC REGIME

3.4.1 Water level observations in the monitors indicate the water table in the project area to be situated in close proximity to the bedrock surface. Due to seasonal fluctuations the water table itself, periodically, may be within bedrock in some areas of the site. Water level data from the cluster monitors indicates a general vertical downward flow component between the overburden and bedrock, providing a mechanism for migration of contaminants through the relatively permeable unconsolidated deposits and into the underlying bedrock aquifer. This mechanism operates independently of, but may be enhanced by, downward flow induced locally by drawdown in water supply wells.

3.4.2 Water level readings in the monitoring wells for May 19, 1983, were used to contour the water table over the site as illustrated on Drawing 5 of Appendix A. These readings indicate the major component of groundwater flow beneath the site to be southward, discharging to Brady Brook south of the site, with minor southwestward and southeastward flow components also apparent. This flow regime is indicated by the large and small arrows, respectively, on Drawing 5. Although not plotted, water level data obtained on other dates from the monitoring wells indicate similar groundwater flow conditions in the project area.

3.4.3 Results of slug tests performed in monitors screened in overburden indicate the horizontal permeability of the glacial outwash deposits to vary between 1 X 10^{-2} cm/sec to 8 x 10^{-5} cm/sec. The range of results may be attributed to the stratified nature of the sediments, with horizontal permeabilities being greater in coarser strata and layers lower in content of "fines" (minus 200 sieve material). Utilization of effective grain size (d_{10}), as determined by laboratory tests on representative split barrel samples (Appendix D), to estimate overall permeability of the overburden deposits (Rose and Smith, 1957) yields values of approximately 5 x 10^{-2} cm/sec.

3.4.4 Constant head tests were performed in monitoring wells constructed in bedrock and selected as representing extremes in rock quality in the boreholes in the project area. Tests in sound rock (B-8R) yield results of 2 x 10^{-3} cm/sec, while tests conducted in poor quality, "seamy" bedrock (B-12R) indicate a greater permeability, on the order of 1 x 10^{-2} cm/sec.

3.4.5 Moderate horizontal groundwater gradients are noted in the area, ranging from 0.01 between monitors B-14 and B-12 on May 19, 1983, to 0.02 between wells B-14 and B-8 on that date. Utilizing the permeability (k) value of 1 x 10^{-2} cm/sec obtained from field tests, and asssuming an average horizontal gradient of 0.015 and an effective porosity of 25 percent in the overburden deposits, horizontal groundwater flow velocity in the project area is estimated to be of the order of magnitude of 1.5 feet per day, or in excess of 500 feet per year.

3.4.6 Water levels noted in the monitoring wells through the course of this study indicate depth to the water table over the site to vary seasonally by several feet or more. In that portion of the site in the vicinity of boreholes B-10, B-15 and B-18, these fluctuations result in the seasonal high water table being within the unconsolidated deposits and low water tables in the underlying bedrock. Vertical transport of contaminants through the soil profile with the fluctuating water table results in a zone of variable thickness of residually contaminated soil; infiltration through this zone may leach contaminants from the soil, with resultant increase in severity and/or persistence of groundwater contamination. This situation may be noted for some time following removal of actual source(s) of contamination.

3.4.7 It should be pointed out that groundwater flow is intergranular, occurring through pore spaces in unconsolidated materials. Groundwater flow through bedrock, however, is facilitated predominantly by secondary permeability features as discussed above. Selective or preferential contaminant migration along certain fractures or fracture sets commonly occurs in bedrock.

3.5 HYDROCARBON CONTAMINATION

3.5.1 Results of chemical analyses performed on groundwater samples obtained on June 22 - 24, 1983, from the monitoring wells in the project area are included with this report as Appendix E. Note that samples from the surface of the standing water column as well as of "regenerated" groundwater were collected from those monitors containing water; all samples obtained were analyzed for concentrations of selected aromatic hydrocarbons.

3.5.2 The chemical anlysis results indicate hydrocarbon contamination of groundwater in monitors B-3, B-11R and B-16R, where the presence of gasoline is indicated, as well as in monitor B-18R, where gasoline was not confirmed. Lesser concentrations of hydrocarbon compounds are also apparent in analyses of regenerated water from monitors B-17 and B-6, while remaining samples contained less than one part per billion of each of the parameters analyzed.

3.5.3 A plot of total aromatic hydrocarbon concentrations in regenerated water samples is presented as Drawing 6 in Appendix A. As indicated on Drawing 6 and by the geochemistry of water samples from monitoring wells B-3, B-11R, B-16R and B-18R, a contaminant plume extends downgradient from the Amoco station and encompasses the Surplus Store water supply well. Analyses of groundwater samples from monitor cluster B-14, upgradient of the Amoco station, indicate no contamination of groundwater by hydrocarbons at that point.

3.5.4 Data pertaining to hydrocarbon contamination in monitor B-17, due to location of this monitor downgradient of both the Amoco station and Maxwell Engine Rebuilders, is presently inconclusive and therefore open to alternative interpretations. This contamination may represent either the periphery of the contaminant plume emanating from the Amoco station, or hydrocarbon contamination originating from Maxwell Engine Rebuilders.

3.5.5 No measurable free product has been observed in the monitors or supply wells investigated in the project area during the time frame of this study. However, a distinct hydrocarbon odor and film in auger cuttings and wash water were observed during the drilling of monitor B-15 immediately south (downgradient) of buried storage tanks at the Amoco station. Due to fluctuation of the water table (3.4.6), this monitor was dry at the time of chemical sampling in June 1983.

3.5.6 Geochemical data, in conjunction with site hydrogeology, indicate the major source of hydrocarbon contamination of the subsurface in the project area to be the active Amoco station on Route 22.

3.5.7 The presence of "windows" (deep, active supply wells) in the local aquifer, within and immediately downgradient of the source area and contaminant plume, enhances the potential for vertical migration of contaminants within the aquifer due to pumping from these wells. This occurrence is documented by cluster monitor B-16, where geochemical data indicates the presence of volatile hydrocarbon compounds in deep monitor B-16R but not in the monitor screened across the water table, where such contamination would normally be found. This situation is interpreted as indicating vertical migration of contaminants within the aquifer resulting from pumping in the Supply Store water well.

3.6 REMEDIATION & REPLACEMENT WATER SUPPLIES

3.6.1 Efforts should be undertaken to ascertain and remove the actual sources of contaminant loss at the Amoco station, and to determine the nature of any such losses, such as isolated versus ongoing release from tanks, plumbing, pumps or other sources. Following cessation of any direct contaminant release, residual contamination (3.4.6) should be minimized through removal of contaminated soil and its replacement by clean material, with the source area capped with impermeable material as appropriate to reduce infiltration and leaching of residual contaminants into groundwater. Removal, replacement and encapsulation is recommended due to the restricted areas and volumes anticipated and the probability of persistent groundwater contamination if action is not taken to reduce or eliminate residual soil contamination.

3.6.2 Use of hydrocarbon-containing agents to clean equipment at Maxwell Engine Rebuilders should be restricted, or such cleansing should be performed only on decontamination pads allowing containment and recovery of any solvents used.

3.6.3 Surface runoff from the engine wash area at Maxwell Engine Rebuilders flows toward the wellhouse at Mario's Pizza, with resultant potential for direct hydrocarbon contamination of that supply well. Measures in addition to 3.6.2 above to reduce this potential are recommended.

3.6.4 Under present conditions, new large-capacity water supply wells in the area, such as that for Burger King immediately north of the Amoco station, may alter groundwater and contaminant flow directions and rates or otherwise effect the local groundwater flow regime. Cluster monitor B-14 does not extend to depths in the aquifer suitable for detection of possible contaminant migration toward the Burger King supply well.

3.6.5 Remedial actions should include, but not be limited to, measures outlined in 3.6.1 and 3.6.2. In addition, dilution and dispersion of hydrocarbon contamination in groundwater should occur in a relatively short time if contaminant input were to be restricted through procedures outlined above, and vertical migration of contaminants into the deep bedrock groundwater system was eliminated by temporary abandonment of the deep water supply wells affected by contamination.

3.6.6 It should be realized that an aquifer system such as that in the project area, with relatively permeable granular sediments unprotected at the surface and hydraulically connected to a bedrock aquifer of high permeability itself, is very susceptible to widespread lateral and vertical contamination

2.24

if reasonable precautions are not undertaken. "Normal" hydrocarbon contamination associated with vehicle traffice areas can, in time, cause problems with groundwater quality; water supply wells should ideally be located at some distance from, or upgradient of, vehicle traffic, parking and maintenance areas, or otherwise protected from contamination related to these potential sources.

2.25

SECTION 4

CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

4.1.1 The local aquifer is comprised of hydraulically connected unconsolidated granular deposits and carbonate bedrock.

4.1.2 Hydrocarbon contamination of groundwater in the project area has been documented, independently of the local supply well system, by this hydrogeologic study.

4.1.3 The major source of hydrocarbon contamination encountered in this study is indicated to be the Amoco station in the project area.

4.1.4 Pumping of deep water supply wells in the area enhances the potential for contamination of the aquifer over a wide depth interval.

4.1.5 Determination of the full vertical extent of hydrocarbon contamination of the aquifer in the project area is beyond the scope of the existing monitoring well network and this phase of study.

4.1.6 The lower contaminant concentrations noted in several supply wells and monitors may represent the margins of the contaminant plume or may be related to activities in the vicinity of these wells.

4.1.7 Initial indications are that the contaminant plume may disperse in a relatively short period if both contaminant input at its source(s) and residual contamination are eliminated.

4.2 RECOMMENDATIONS

4.2.1 Inspection of operations and facilities at the Amoco station should be undertaken and remedial measures completed as warranted to remove sources of contamination at that facility. Potential sources of residual contamination should also be remediated as discussed previously.

4.2.2 Ongoing assessment of groundwater quality in supply wells and monitors through same-day sampling at all data points is recommended to evaluate the rate of migration of the plume downgradient of the indicated source, and to investigate whether hydrocarbon contamination found at a distance downgradient of the indicated source is the result of contaminant plume migration or localized hydrocarbon contamination.

4.2.3 Remediation of local groundwater contamination and provision of replacement water supplies to affected parties must involve coordinated removal of contaminant sources and temporary abandonment of affected supply wells. As a minimum, the Surplus Store and Corral Ford supply wells should be temporarily abandoned to eliminate possible ongoing verticle migration of contaminants, resulting from use of these wells, into the deep bedrock aquifer.

4.2.4 A survey of supply wells in the project area should be considered mandatory in providing data critical to project resolution. Well depths, static water levels, pumping levels, pump/intake elevations and cased versus open hole intervals are among the data necessary for both the assessment of the nature and extent of local groundwater contamination and generation of design details for any required replacement supply wells.

4.2.5 Installation of replacement supply wells should be held in abeyance until additional data on site hydrogeology and existing wells is obtained. Data presently available in these regards is insufficient for consideration of new supply well locations and installation details.

4.2.6 Additional work to define the vertical extent of hydrocarbon contamination in the aquifer may be warranted to target suitable intake zones for replacement supply wells, and to provide data for design of such wells. This work may include conversion of existing deep supply wells to multiple-level sampling points and/or installation of purpose-built instrumentation for that purpose.

4.2.7 A deep groundwater monitor, of suitable design, should be installed between the Amoco station and Burger King. Routine assessment of groundwater quality utilizing this monitor would facilitate early detection of any contaminant migration which may occur toward the Burger King supply well.

4.2.8 The enclosure for the supply well for Marios Pizza should be shielded against direct entry of surface runoff from the surrounding parking area and the engine wash area at Maxwell Engine Rebuilders.

4.2.9 In addition to all monitors installed for this investigation, any abandoned water supply wells in which groundwater contamination is not observed to abate through time should be grouted upon project closure.

7.28

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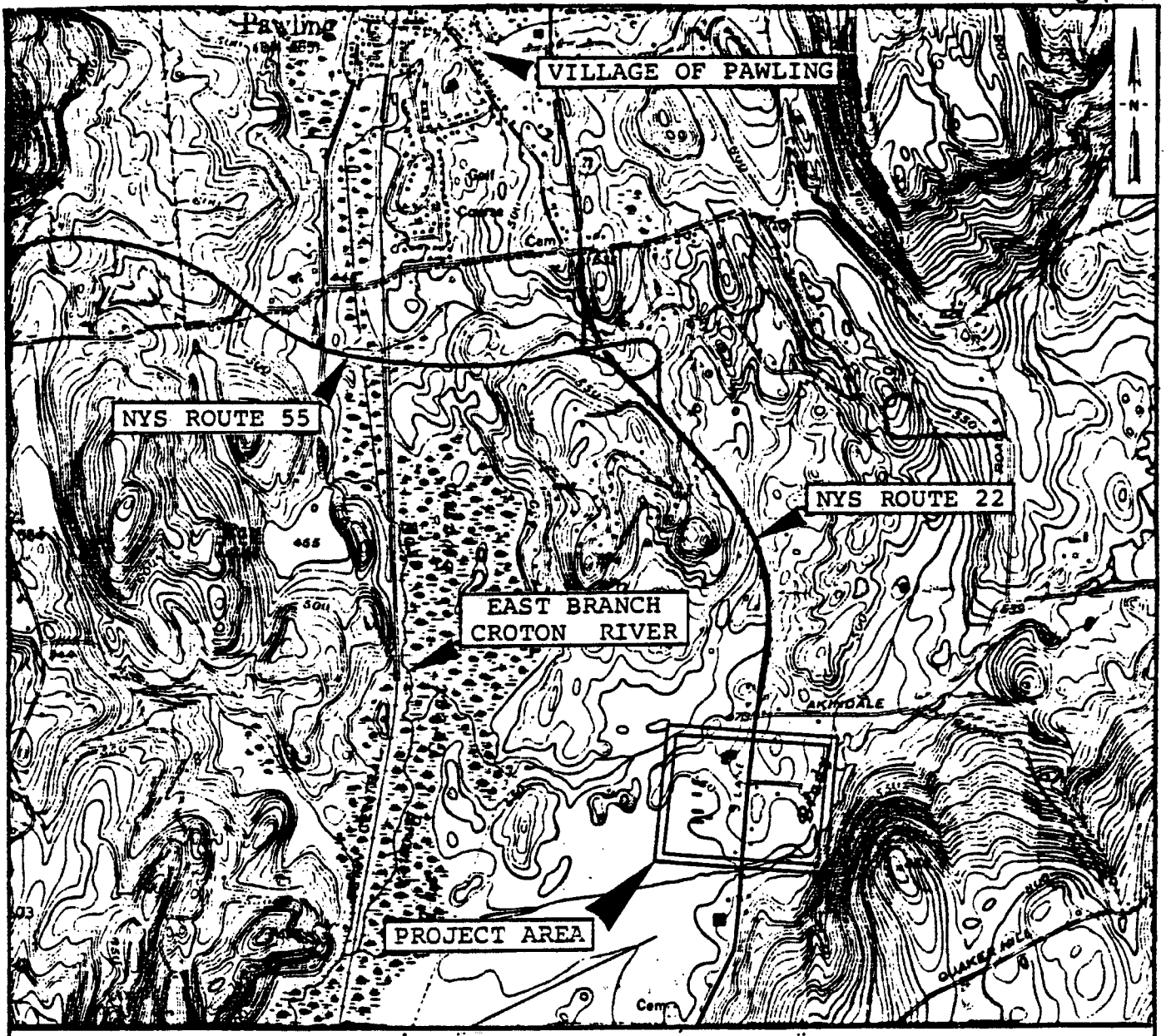
APPENDIX A

Drawings



SCALE 1:24000

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1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

DATUM IS MEAN SEA LEVEL

QUADRANGLE LOCATION

DETAIL FROM:

PAWLING, N.Y.—CONN.
N4130—W7330/7.5

1958
PHOTOREVISED 1971
AMS 6267 II SE-SERIES 821

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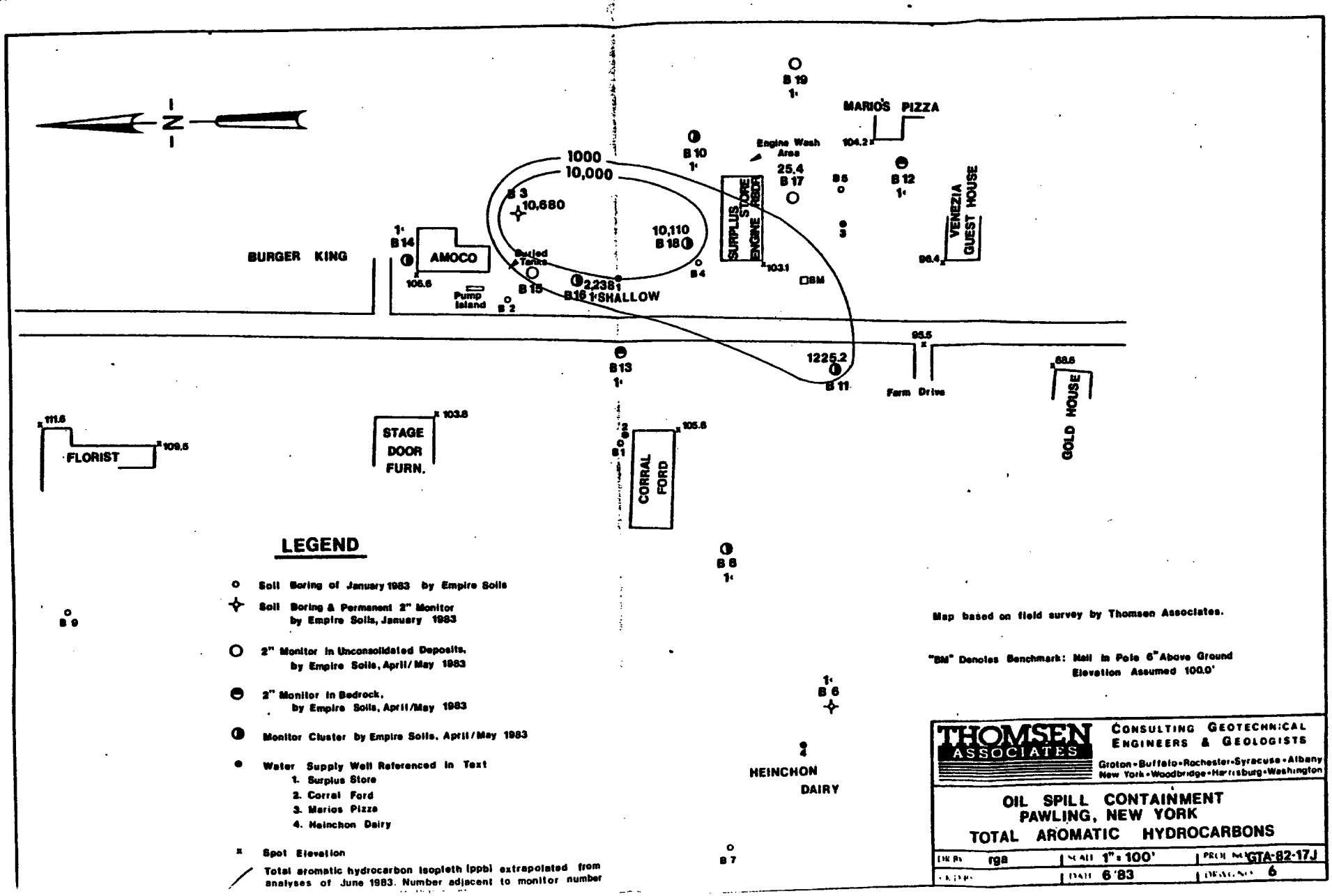
OIL SPILL CONTAINMENT - PAWLING, N.Y.

SITE LOCATION MAP

DR BY:	SCALE as shown	PROJ NOGTA-82-17J
CK'D BY:	DATE 1-83	DRWG NO 1



LEGEND

- Soil Boring of January 1983 by Empire Soils
- Soil Boring & Permanent 2" Monitor by Empire Soils, January 1983
- 2" Monitor in Unconsolidated Deposits, by Empire Soils, April/May 1983
- 2" Monitor in Bedrock, by Empire Soils, April/May 1983
- Monitor Cluster by Empire Soils, April/May 1983
- Water Supply Well Referenced in Text
  1. Surplus Store
  2. Corral Ford
  3. Marios Pizza
  4. Heinchon Dairy
- Spot Elevation
- Total aromatic hydrocarbon isopleth (ppb) extrapolated from analyses of June 1983. Number adjacent to monitor number

Map based on field survey by Thomsen Associates.

"BM" Denotes Benchmark: Nail in Pole 6" Above Ground Elevation Assumed 100.0'

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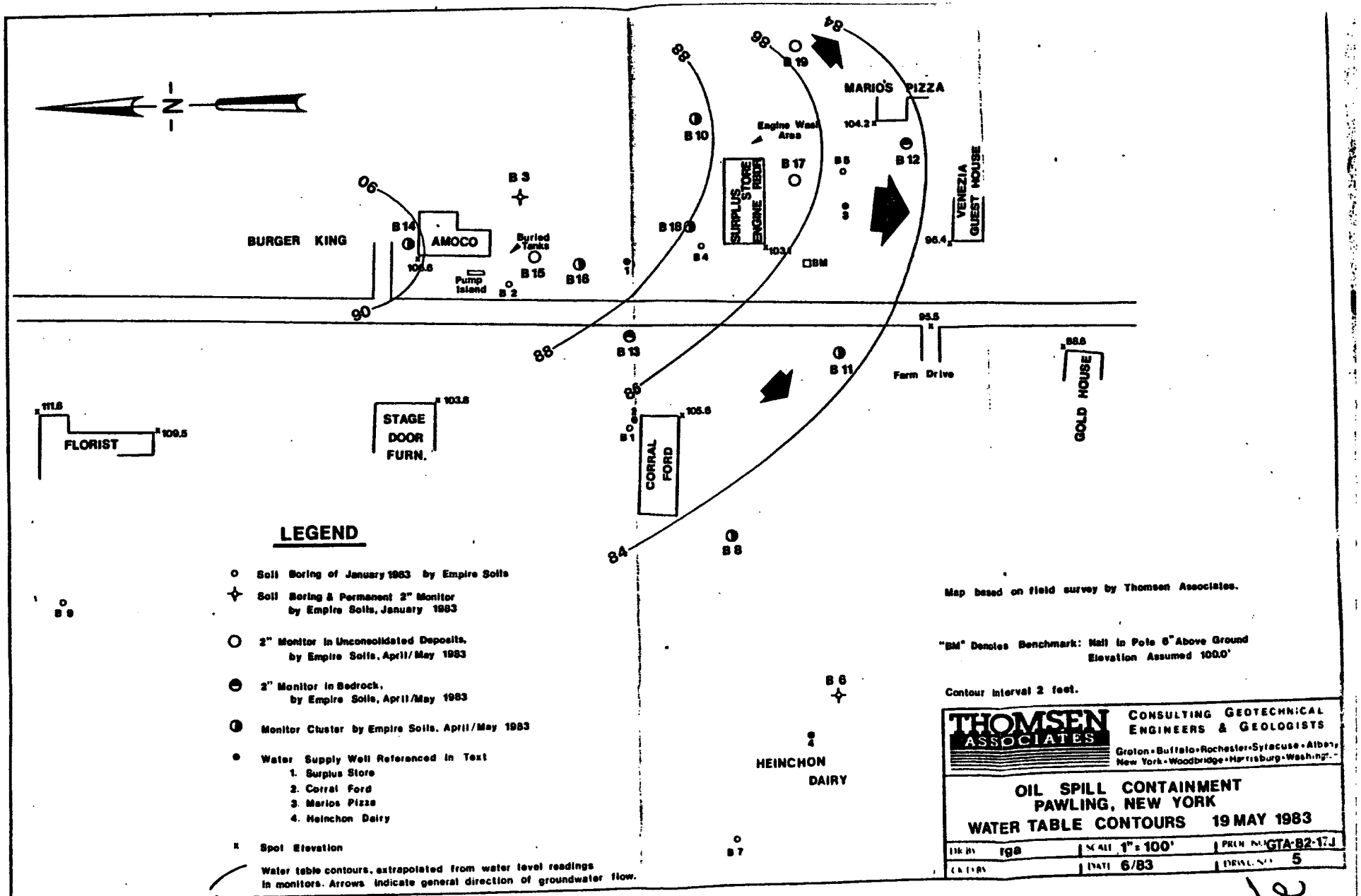
OIL SPILL CONTAINMENT
PAWLING, NEW YORK
TOTAL AROMATIC HYDROCARBONS

DRN: rga	SCALE: 1" = 100'	PROJ. NO: GTA-82-17J	
CHKD:	DATE: 6'83	DRAWING NO: 6	


N
BURGER KING
AMOCO
B 14
B 3
Buried Tanks
B 15
B 16
Pump Island
B 2
B 10
B 19
Engine Weal Area
B 17
B 18
B 4
SURPLUS STORE ENGINE RBLD
B 5
B 12
MARIO'S PIZZA
104.2
VENEZIA GUEST HOUSE
96.4
103.4
BM
95.5
Farm Drive
B 13
B 11
88.6
GOLD HOUSE
111.6
FLORIST
109.5
103.8
STAGE DOOR FURN.
B 9
B 1
105.6
CORRAL FORD
B 8
B 6
4
HEINCHON DAIRY
B 7
LEGEND
Soil Boring of January 1983 by Empire Soils
Soil Boring & Permanent 2" Monitor by Empire Soils, January 1983
2" Monitor in Unconsolidated Deposits, by Empire Soils, April/May 1983
2" Monitor in Bedrock, by Empire Soils, April/May 1983
Monitor Cluster by Empire Soils, April/May 1983
Water Supply Well Referenced in Text
1. Surplus Store
2. Corral Ford
3. Marios Pizza
4. Heinchon Dairy
Spot Elevation
Water table contours, extrapolated from water level readings in monitors. Arrows indicate general direction of groundwater flow.
Map based on field survey by Thomsen Associates.
"BM" Denotes Benchmark: Nail in Pole 6" Above Ground Elevation Assumed 100.0'
Contour interval 2 feet.
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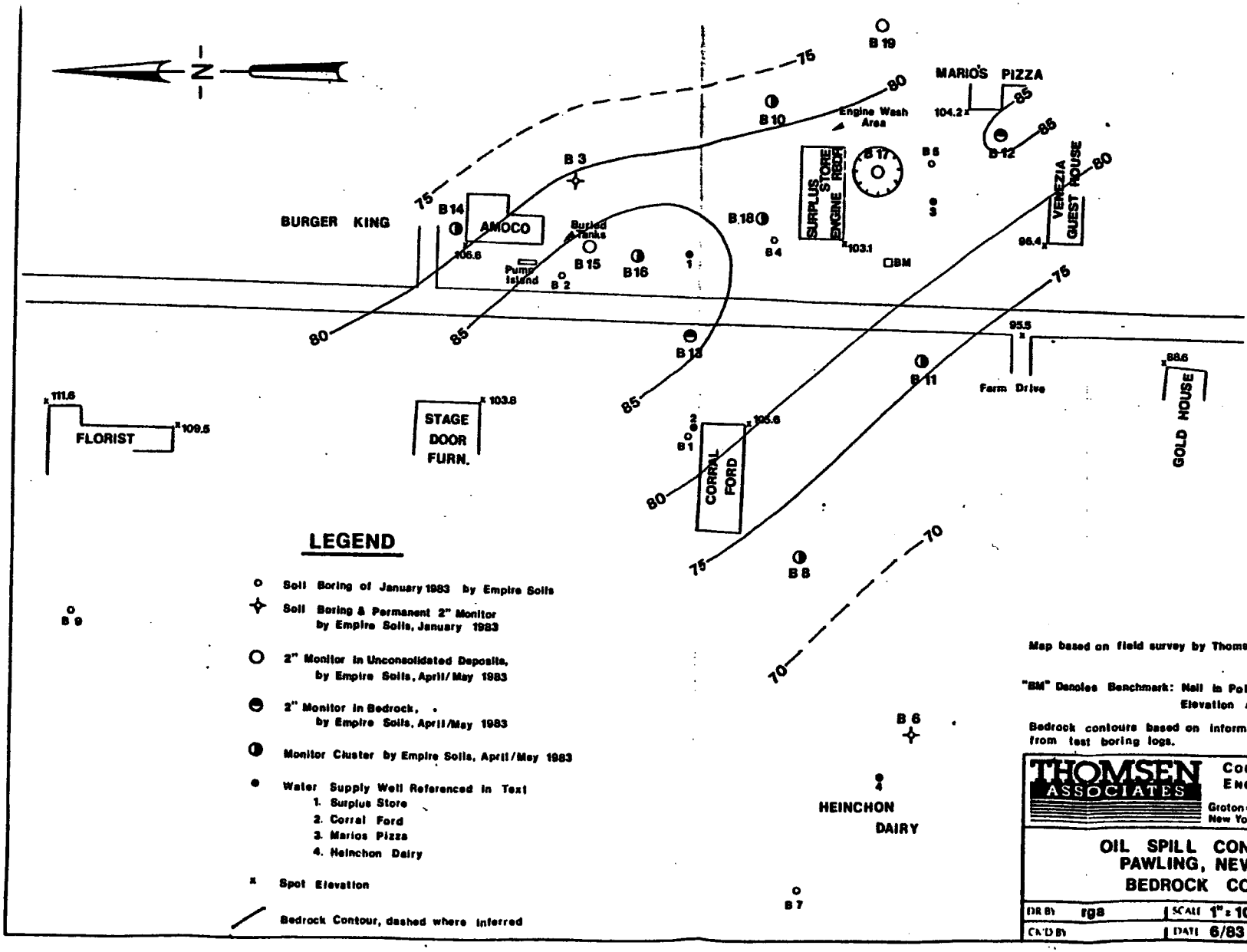
OIL SPILL CONTAINMENT
PAWLING, NEW YORK
WATER TABLE CONTOURS 19 MAY 1983
DRN rga
SCALE 1" = 100'
PROJ NO GTA-B2-17J
CHKD
DATE 6/83
DRWG NO 5



LEGEND

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- Water Supply Well Referenced in Text
  1. Surplus Store
  2. Corral Ford
  3. Marios Pizza
  4. Heinchon Dairy
- Spot Elevation
- Bedrock Contour, dashed where inferred

Map based on field survey by Thomsen Associates.

"BM" Denotes Benchmark: Nail in Pole 6"Above Ground Elevation Assumed 100.0'

Bedrock contours based on information extrapolated from test boring logs.

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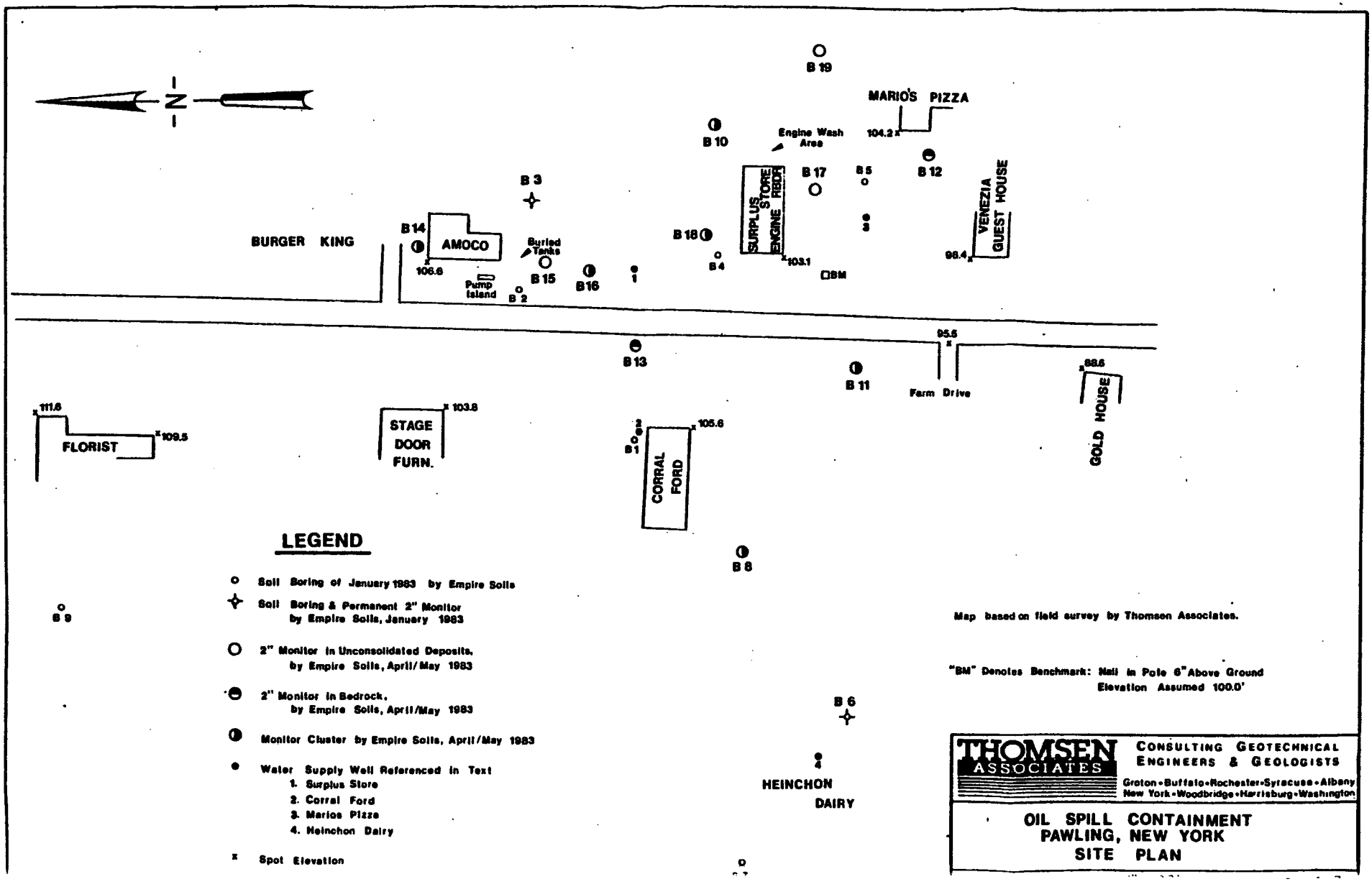
OIL SPILL CONTAINMENT
PAWLING, NEW YORK
BEDROCK CONTOURS

DR BY rgs	SCALE 1" = 100'	PROJ NO GTA-82-17
CK'D BY	DATE 6/83	DRWG NO 4

2-34



LEGEND

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  1. Surplus Store
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  3. Marios Pizza
  4. Heinchon Dairy
- Spot Elevation

Map based on field survey by Thomsen Associates.

"BM" Denotes Benchmark: Nail in Pole 6" Above Ground
Elevation Assumed 100.0'

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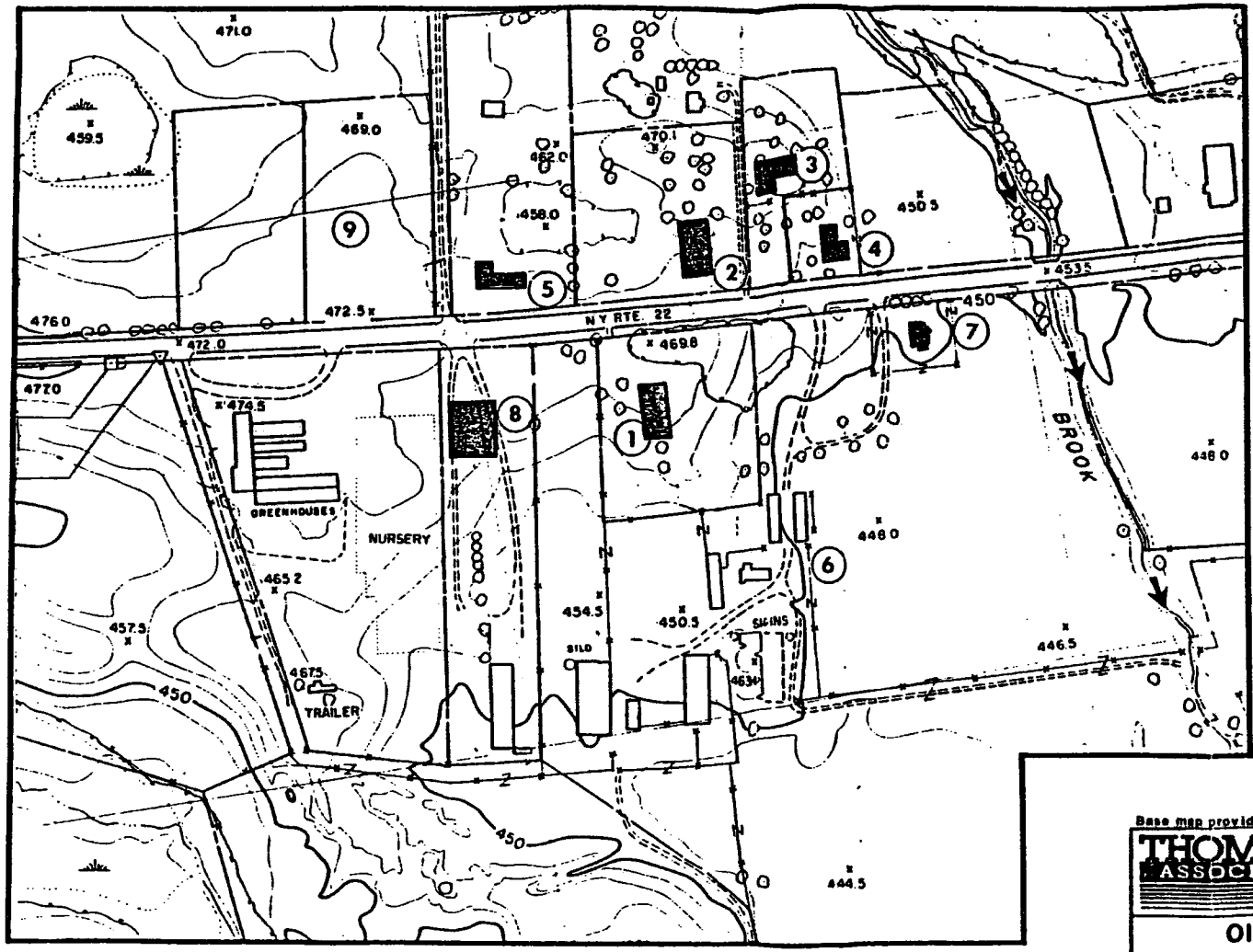
OIL SPILL CONTAINMENT
PAWLING, NEW YORK
SITE PLAN

2.35



1 Corral Ford
2 Surplus Store
3 Marios Pizza
4 Venezia Guest House
5 Amoco
6 Heinchon Dairy
7 Gold House
8 Stage Door Furniture
9 Burger King

Base map provided by NYSDOT Oil Spill Engineer.

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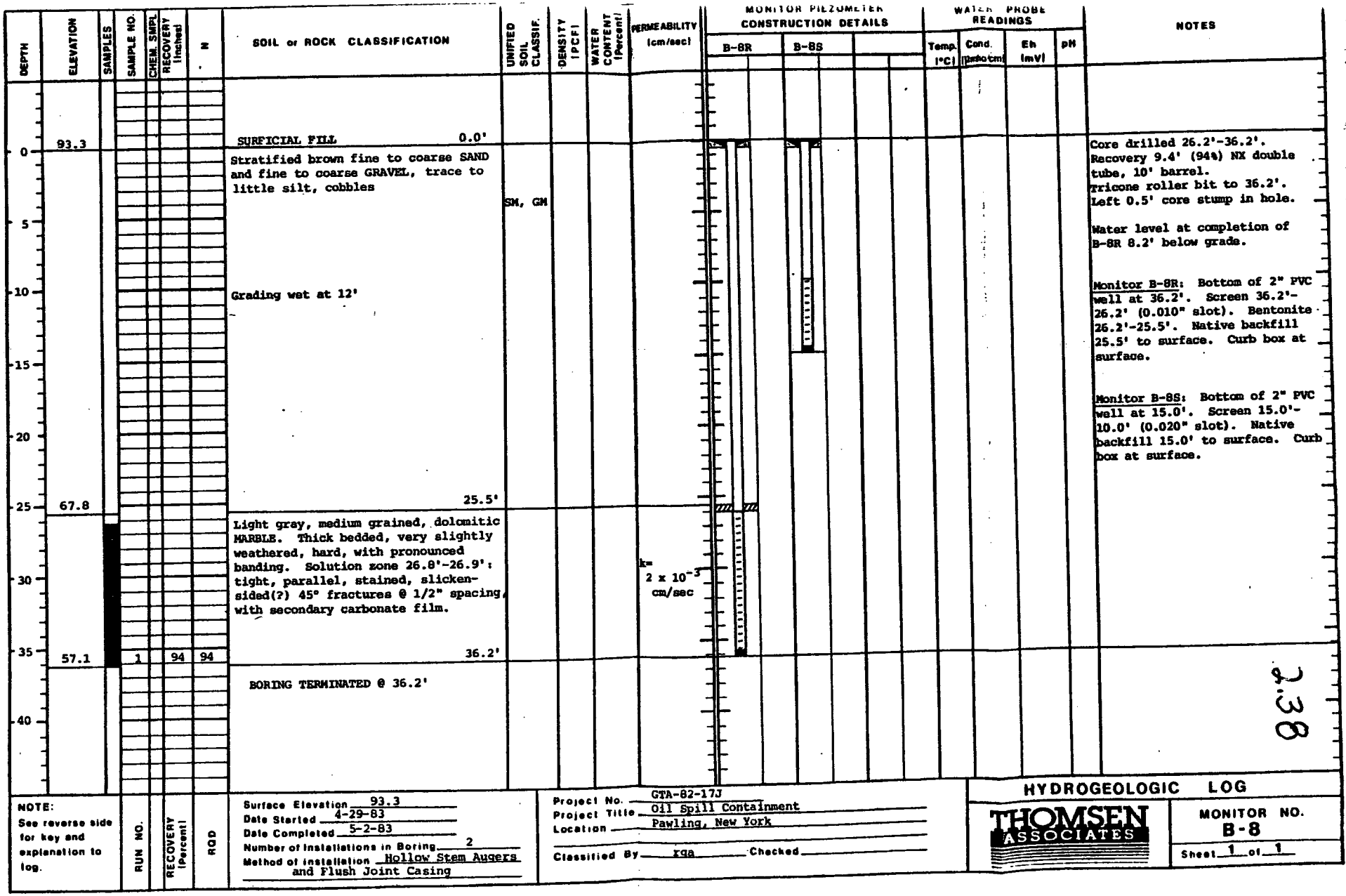
OIL SPILL CONTAINMENT
PAWLING, NEW YORK
VICINITY MAP

DRN. rga	SCALE 1" = 200'	PROJ. NO. GTA-82-17J
CK'D BY	DATE 8/83	DRWG. NO. 2

2-36

APPENDIX B

Subsurface & Hydrogeologic Logs


DEPTH
ELEVATION
SAMPLES
SAMPLE NO.
CHEM. SMPL
RECOVERY (inches)
N
SOIL or ROCK CLASSIFICATION
UNIFIED SOIL CLASSIF.
DENSITY (PCF)
WATER CONTENT (Percent)
PERMEABILITY (cm/sec)
MONITOR PIEZOMETER CONSTRUCTION DETAILS
B-8R
B-8S
WATER PROBE READINGS
Temp. (°C)
Cond. (μmho/cm)
Eh (mV)
pH
NOTES
93.3
SURFICIAL FILL 0.0'
Stratified brown fine to coarse SAND and fine to coarse GRAVEL, trace to little silt, cobbles
SM, GM
Grading wet at 12'
25.5'
67.8
Light gray, medium grained, dolomitic MARBLE. Thick bedded, very slightly weathered, hard, with pronounced banding. Solution zone 26.8'-26.9': tight, parallel, stained, slickensided(?) 45° fractures @ 1/2" spacing, with secondary carbonate film.
k= 2 x 10^-3 cm/sec
36.2'
57.1
1
94
94
BORING TERMINATED @ 36.2'
0
5
10
15
20
25
30
35
40
Core drilled 26.2'-36.2'. Recovery 9.4' (94%) NX double tube, 10' barrel. Tricone roller bit to 36.2'. Left 0.5' core stump in hole.
Water level at completion of B-8R 8.2' below grade.
Monitor B-8R: Bottom of 2" PVC well at 36.2'. Screen 36.2'-26.2' (0.010" slot). Bentonite 26.2'-25.5'. Native backfill 25.5' to surface. Curb box at surface.
Monitor B-8S: Bottom of 2" PVC well at 15.0'. Screen 15.0'-10.0' (0.020" slot). Native backfill 15.0' to surface. Curb box at surface.
238
NOTE: See reverse side for key and explanation to log.
RUN NO.
RECOVERY (Percent)
RQD
Surface Elevation 93.3
Date Started 4-29-83
Date Completed 5-2-83
Number of Installations in Boring 2
Method of Installation Hollow Stem Augers and Flush Joint Casing
Project No. GTA-82-17J
Project Title Oil Spill Containment
Location Pawling, New York
Classified By rga Checked
HYDROGEOLOGIC LOG
THOMSEN ASSOCIATES
MONITOR NO. B-8
Sheet 1 of 1

DEPTH	ELEVATION	SAMPLES	SAMPLE NO.	CHEM. SMPL	RECOVERY (inches)	N	SOIL or ROCK CLASSIFICATION	UNIFIED SOIL CLASSIF.	DENSITY (PCF)	WATER CONTENT (Percent)	PERMEABILITY (cm/sec)	MONITOR PIEZOMETER CONSTRUCTION DETAILS	WATER PROBE READINGS	NOTES
												B-10R B-10S	Temp. (°C) Cond. (µmho/cm) Eh (mV) pH	
0	101.1						SURFICIAL FILL 0.0'							
			1			16	Stratified brown fine to coarse SAND and fine to coarse GRAVEL, trace to little silt, cobbles	SM,GM						Core drilled 25.0'-35.0'. Recovery 9.8' (98%) NX tube, 10' barrel.
5			2			14								Water level at completion of B-10R 11.3' below grade.
			3			10								
			4			18								Monitor B-10R: Bottom of 2" PVC well at 35.0'. Screen 35.0'-25.0' (0.020" slot). Bentonite 25.0'-24.5'. Native backfill 24.5' to surface. Protective pipe at surface. PVC extends 2.6' above grade.
10			5			21								
			6			9					k= 3 x 10^{-4} cm/sec			
			7			5	Grading wet at 14'							
15			8			16								
			9			26								
			10			31								
20														
	76.6						24.5'							
25							Light gray to white, medium grained dolomitic MARBLE. Thin to medium bedded, moderately weathered, with numerous tight & open 40°-50° stained fractures and irregular solution cavities. Fractures exhibit secondary, slickensided(?) carbonate films. 28'±							Lost drilling water at 28.6'.
	73.1													
30														
	66.1		1		98	98	Gray dolomitic MARBLE. Thick bedded, slightly weathered, with several tight slickensided 50° fractures. Fractures stained & discoloration extends into rock up to several inches. 35.0'							
35							BORING TERMINATED @ 35.0'							

NOTE: See reverse side for key and explanation to log.

RUN NO. | RECOVERY (Percent) | ROD

Surface Elevation 101.1
Date Started 5-5-83
Date Completed 5-9-83
Number of Installations in Boring 2
Method of Installation Hollow Stem Augers and Flush Joint Casing

Project No. GTA-82-17J
Project Title Oil Spill Containment
Location Pawling, New York
Classified By rga Checked

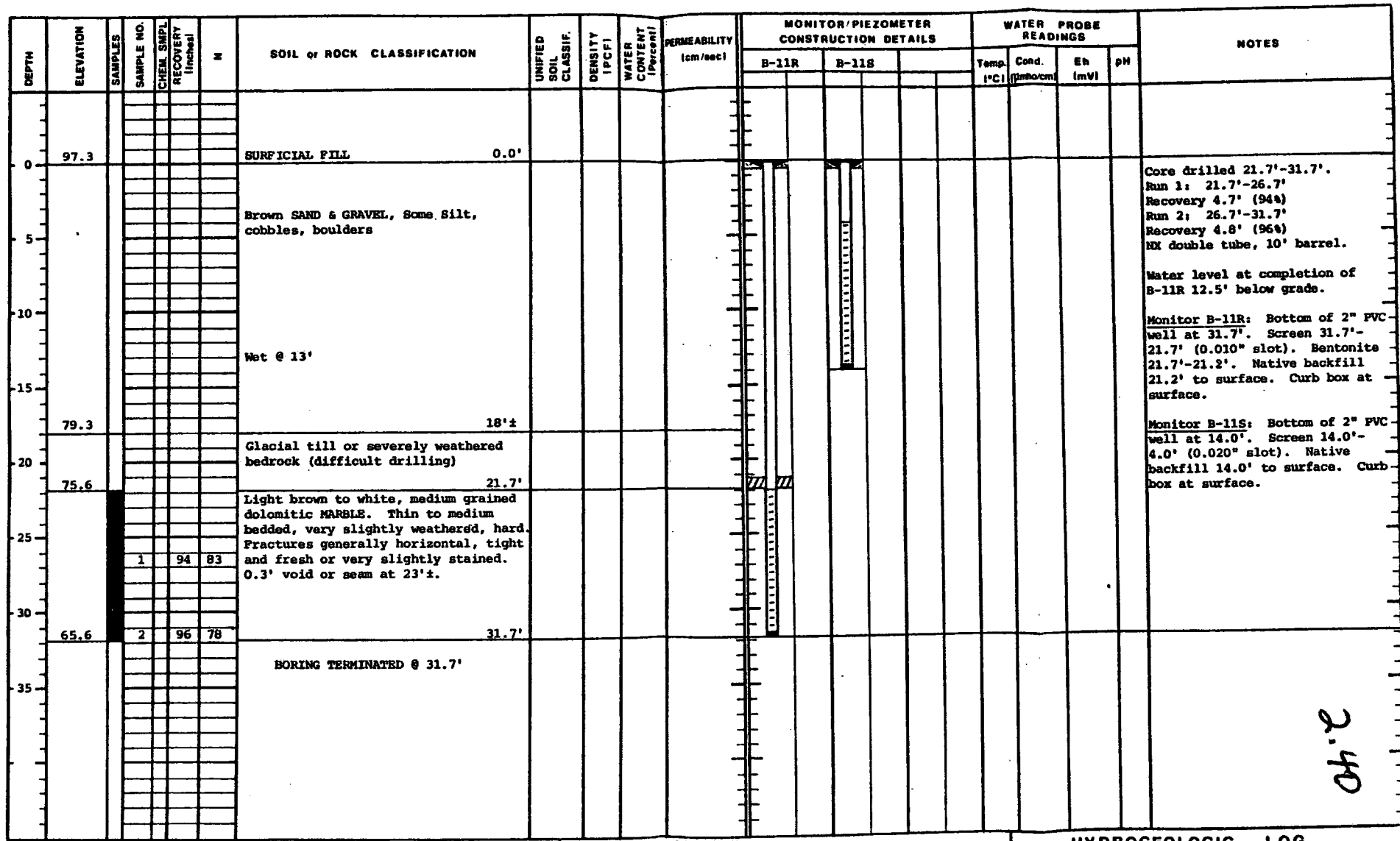
HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. B-10

Sheet 1 of 1

2.39



NOTE: See reverse side for key and explanation to log.

RUN NO. | RECOVERY (Percent) | ROD

Surface Elevation 97.3
Date Started 4-27 and 5-10-83
Date Completed 4-27 and 5-10-83
Number of Installations in Boring 2
Method of Installation Hollow Stem Augers and Flush Joint Casing

Project No. GTA-82-17J
Project Title Oil Spill Containment
Location Pawling, New York
Classified By rga Checked

HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. B-11

Sheet 1 of 1

2.40

DEPTH	ELEVATION	SAMPLES	SAMPLE NO.	CHEM. SMPL.	RECOVERY (inches)	N	SOIL or ROCK CLASSIFICATION	UNIFIED SOIL CLASSIF.	DENSITY (PCF)	WATER CONTENT (Percent)	PERMEABILITY (cm/sec)	MONITOR PIEZOMETER CONSTRUCTION DETAILS B-12R	WATER PROBE READINGS Temp. (°C)	Cond. (µmho/cm)	Eh (mV)	pH	NOTES
0	101.1						SURFICIAL FILL 0.0'										
5							Stratified brown fine to coarse GRAVEL & SAND, little to Some Silt, cobbles										Core drilled 16.6'-26.6'. Recovery 5.8' (58%) NX double tube, 10' barrel.
10																	Monitor B-12R: Bottom of 2" PVC well at 23.3'. Screen 23.3'-16.3' (0.010" slot). Bentonite 16.3'-16.0'. Native backfill 16.0' to surface. Curb box at surface.
15	85.2						15.9'										
20	81.7						Gray, banded dolomitic MARBLE. Thick bedded, very slightly weathered, hard. 19.4'				k= 1 x 10^{-2} cm/sec						No water in borehole prior to introduction of drilling water. Lost drilling water at 19.4', regained at 24.4'. Water at completion of B-12R 14.5' below grade; water level 1 hour after completion 14.5' below grade. At completion of coring and prior to setting monitor, borehole filled with sand to 23.3'. Following monitor installation, pumped from well at 3gpm for 10 mins. with no drawdown.
25	74.5				58	41	Gray to white dolomitic MARBLE, interbedded with harder banded marble. Moderately to severely weathered, with numerous stained fractures. Voids or seams: 19.4'-19.6'; 19.7'-19.9'; 21.8'- 22.0'; 23.6'-24.3'; 24.4'-24.9' Loosely cemented and friable below 23'. 26.6'										
30							BORING TERMINATED @ 26.6'										
35																	

NOTE: See reverse side for key and explanation to log.

RUN NO. | RECOVERY (Percent) | ROD

Surface Elevation 101.1
Date Started 5-3-83
Date Completed 5-3-83
Number of Installations in Boring 1
Method of Installation Hollow Stem Augers and Flush Joint Casing

Project No. GTA-82-17J
Project Title Oil Spill Containment
Location Pawling, New York
Classified By xga Checked

HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. B-12

Sheet 1 of 1

14.2

DEPTH	ELEVATION	SAMPLES	SAMPLE NO.	CHEM. SMPL	RECOVERY (inches)	N	SOIL or ROCK CLASSIFICATION	UNIFIED SOIL CLASSIF.	DENSITY (PCF)	WATER CONTENT (Percent)	PERMEABILITY (cm/sec)	MONITOR/PIEZOMETER CONSTRUCTION DETAILS	WATER PROBE READINGS				NOTES
												B-13R	Temp. (°C)	Cond. (µmho/cm)	Eh (mV)	pH	
	104.4						SURFICIAL FILL 0.0'										
0							Stratified brown fine to coarse SAND and fine to medium GRAVEL, Some Silt										Core drilled 16.4'-26.4'. Recovery 9.9' (99%) NX double tube, 10' barrel.
5																	Monitor B-13R: Bottom of 2" PVC well at 26.4'. Screen 26.4'-16.4' (0.010" slot). Bentonite 16.4'-16.0'. Native backfill 16.0' to surface. Curb box at surface.
10																	
	91.4						13'±										
							Glacial till or weathered bedrock. 16.0'										No water in borehole prior to introduction of drilling water. Water level 10.5' at completion of hole 1030 hrs 5/3/83. Set 2" monitor and pumped well dry. Water level in well 12.5' 1430 hrs 5/3/83.
15	88.4																
							Gray, medium grained dolomitic MARBLE. Thick bedded, very slightly weathered, with pronounced banding. Solution zone(?) 17.7'-17.8'. Grading at 20' to white, loosely cemented, moderately weathered, friable marble with vertical stained fractures. Severely weathered soft zone 21'-22' (±) 22.0'										
20	82.4																
25	78.0		1		99	95	Gray banded MARBLE, very slightly weathered with occasional very gentle stained fractures. 26.4'										
30							BORING TERMINATED @ 26.4'										

NOTE: See reverse side for key and explanation to log.

RUN NO. | RECOVERY (Percent) | ROD

Surface Elevation 104.4
Date Started 5-2-83
Date Completed 5-3-83
Number of Installations in Boring 1
Method of Installation Hollow Stem Augers and Flush Joint Casing

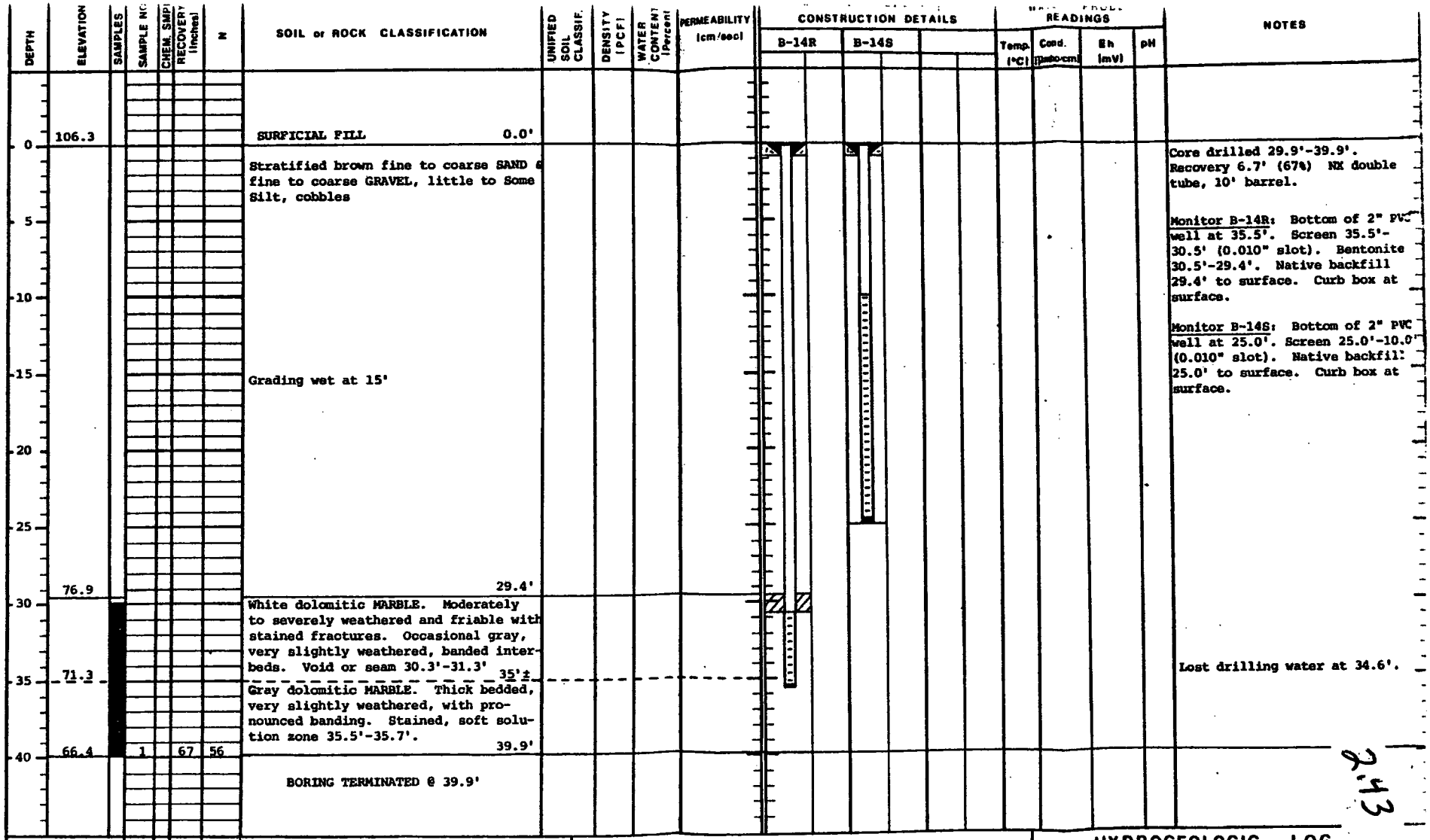
Project No. GTA-82-17J
Project Title Oil Spill Containment
Location Pawling, New York
Classified By rga Checked

HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. B-13

Sheet 1 of 1



NOTE: See reverse side for key and explanation to log.

RUN NO. | RECOVERY (Percent) | ROD

Surface Elevation 106.3
Date Started 5-11-83
Date Completed 5-11-83
Number of Installations in Boring 2
Method of Installation Hollow Stem Augers and Flush Joint Casing

Project No. GTA-82-17J
Project Title Oil Spill Containment
Location Pawling, New York
Classified By rga Checked

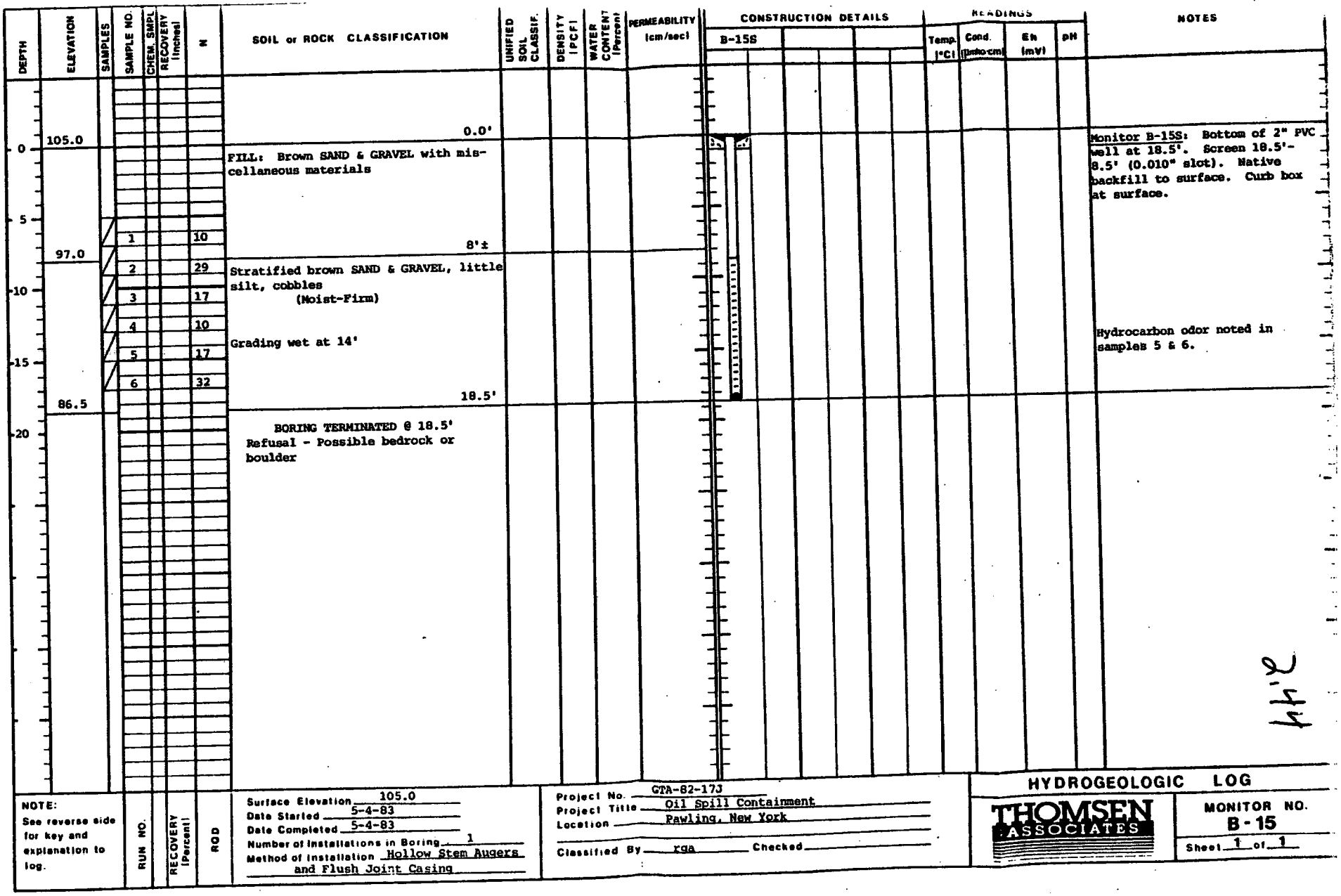
HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. B-14

Sheet 1 of 1

2-43


DEPTH
ELEVATION
SAMPLES
SAMPLE NO.
CHEM. SMPL
RECOVERY (Inches)
N
SOIL or ROCK CLASSIFICATION
UNIFIED SOIL CLASSIF.
DENSITY (PCF)
WATER CONTENT (Percent)
PERMEABILITY (cm/sec)
CONSTRUCTION DETAILS
B-15S
READINGS
Temp. (°C)
Cond. (µmho-cm)
Eh (mV)
pH
NOTES
105.0
0.0'
FILL: Brown SAND & GRAVEL with miscellaneous materials
8'±
97.0
Stratified brown SAND & GRAVEL, little silt, cobbles
(Moist-Firm)
Grading wet at 14'
18.5'
86.5
BORING TERMINATED @ 18.5'
Refusal - Possible bedrock or boulder
Monitor B-15S: Bottom of 2" PVC well at 18.5'. Screen 18.5'-8.5' (0.010" slot). Native backfill to surface. Curb box at surface.
Hydrocarbon odor noted in samples 5 & 6.
1 10
2 29
3 17
4 10
5 17
6 32
0
5
10
15
20
NOTE:
See reverse side for key and explanation to log.
RUN NO.
RECOVERY (Percent)
ROD
Surface Elevation 105.0
Date Started 5-4-83
Date Completed 5-4-83
Number of Installations in Boring 1
Method of Installation Hollow Stem Augers and Flush Joint Casing
Project No. GTA-82-17J
Project Title Oil Spill Containment
Location Pawling, New York
Classified By rga Checked
HYDROGEOLOGIC LOG
THOMSEN ASSOCIATES
MONITOR NO. B-15
Sheet 1 of 1

44-2

DEPTH	ELEVATION	SAMPLES	SAMPLE NO.	CHEM. SMPL.	RECOVERY (inches)	N	SOIL or ROCK CLASSIFICATION	UNIFIED SOIL CLASSIF.	DENSITY (PCF)	WATER CONTENT (Percent)	PERMEABILITY (cm/sec)	MONITOR/PIEZOMETER CONSTRUCTION DETAILS	WATER PROBE READINGS	NOTES
												B-16R / B-16S	Temp. (°C) / Cond. (µmhos) / Eh (mV) / pH	
0	100.8						SURFICIAL FILL 0.0'							
0							Stratified brown fine to coarse SAND and fine to medium GRAVEL, trace to little silt, cobbles (Damp-Firm)	SM, GM						Core drilled 22.0'-32.0'. Recovery 8.2' (82%) NX double tube, 10' barrel.
5			1			13								Water level at completion of B-16R 9.7' below grade.
	91.1		2			18	9.7'							Monitor B-16R: Bottom of 2" PVC well at 32.0'. Screen 32.0'-27.0' (0.010" slot). Bentonite 24.5'-25.0'. Native backfill 25.0' to surface. Protective pipe at surface. PVC extends 2.2' above grade.
10			3			19	Grading wet at 10'				k= 2 x 10^{-4} cm/sec			
			4			28	Severely to completely weathered bedrock and/or glacial till (?)							
15														
20	80.3						20.5'							Monitor B-16S: Bottom of 2" PVC well at 16.5'. Screen 16.5'-2.0' (0.010" slot). Protective pipe at surface. PVC extends 2.4' above grade.
							Severely weathered, fragmented friable white MARBLE (Boulders?) Sand seam 21.4'-22.0'							
	75.8						25'							
25							Light gray dolomitic MARBLE. Thick bedded, hard, very slightly weathered and well banded. Several very gentle tight fractures and steep (45° and 60°), stained and weathered fractures.							At completion of core drilling borehole caved to 25'. Spun casing to 25.2', cleaned hole to 32' and installed B-16R.
30	68.8		1		82	68	32.0'							
							BORING TERMINATED @ 32.0'							
35														

NOTE: See reverse side for key and explanation to log.

RUN NO. | RECOVERY (Percent) | ROD

Surface Elevation 100.8
Date Started 5-3-83
Date Completed 5-4-83
Number of Installations in Boring 2
Method of Installation Hollow Stem Augers and Flush Joint Casing

Project No. GTA-82-17J
Project Title Oil Spill Containment
Location Pawling, New York
Classified By rga Checked

HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. B-16

Sheet 1 of 1

54.2

DEPTH	ELEVATION	SAMPLES	SAMPLE NO.	CHEM. SMPL.	RECOVERY (inches)	N	SOIL or ROCK CLASSIFICATION	UNIFIED SOIL CLASSIF.	DENSITY (PCF)	WATER CONTENT (Percent)	PERMEABILITY (cm/sec)	MONITOR PIEZOMETER CONSTRUCTION DETAILS	WATER PROBE READINGS				NOTES
												B-17S	Temp. (°C)	Cond. (μmho/cm)	Eh (mV)	pH	
0	102.1						SURFICIAL FILL 0.0'										
							Stratified brown fine to coarse SAND and fine to coarse GRAVEL, little to Some Silt, cobbles										Monitor B-17S: Bottom of 2" PVC well at 19.6'. Screen 19.6'-14.6' (0.010" slot). Bentonite 14.6'-14.0'. Native backfill 14.0' to surface. Curb box at surface.
5																	
10																	
15	88.1						14'±										
							Nested boulders in overburden, or possible severely weathered, seamy bedrock.										Water level 14.9' in monitor at completion of installation.
20	79.1						23.0'										
25							BORING TERMINATED @ 23.0'										

NOTE:
See reverse side for key and explanation to log.

RUN NO.

RECOVERY (Percent)

ROD

Surface Elevation 102.1
Date Started 5-11-83
Date Completed 5-12-83
Number of Installations in Boring 1
Method of Installation Hollow Stem Augers and Flush Joint Casing

Project No. GTA-82-17J
Project Title Oil Spill Containment
Location Pawling, New York
Classified By rga Checked

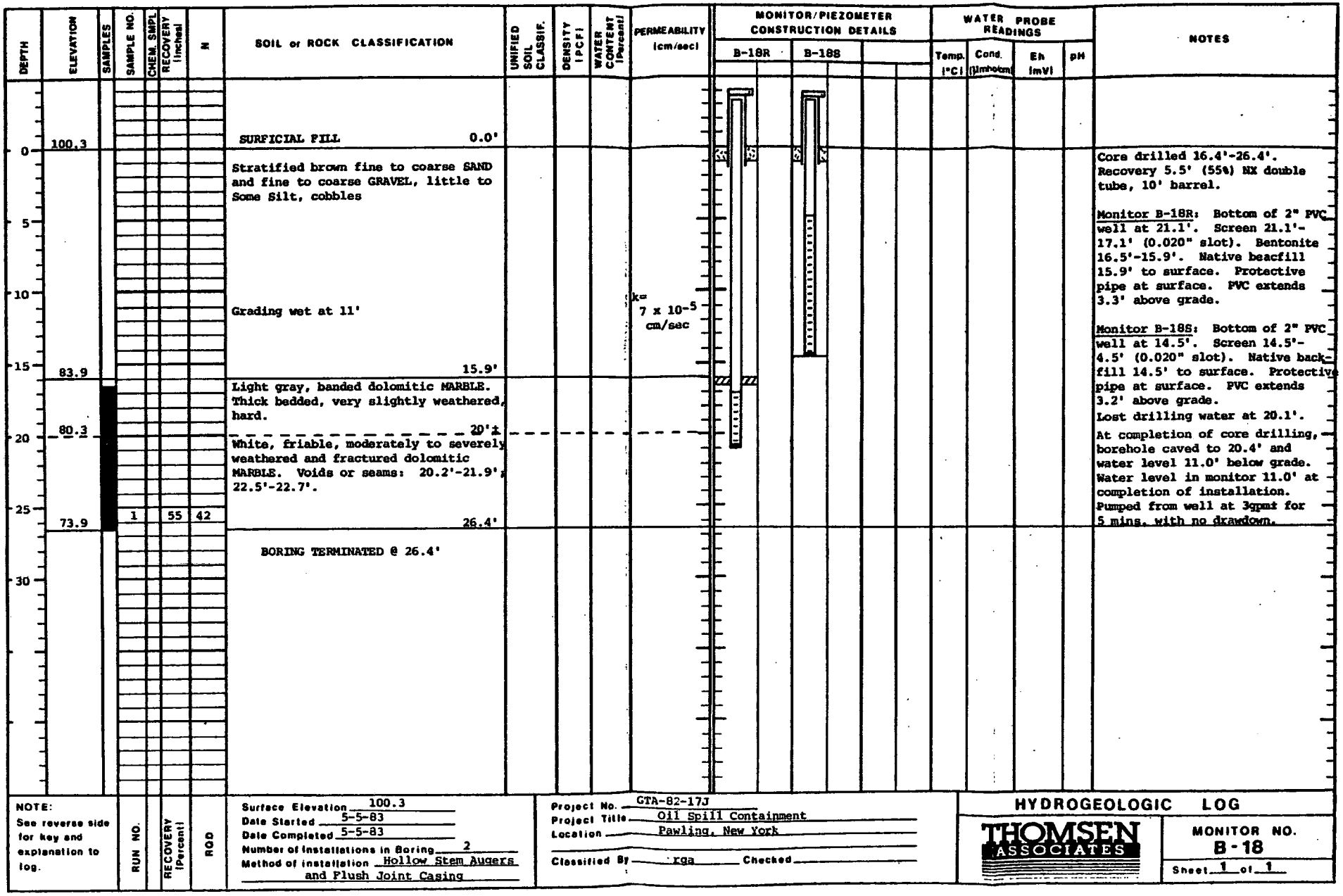
HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. B-17

Sheet 1 of 1

2.46



NOTE: See reverse side for key and explanation to log.

RUN NO. | RECOVERY (Percent) | ROD

Surface Elevation 100.3
Date Started 5-5-83
Date Completed 5-5-83
Number of Installations in Boring 2
Method of Installation Hollow Stem Augers and Plush Joint Casing

Project No. GTA-82-17J
Project Title Oil Spill Containment
Location Pawling, New York
Classified By rga Checked

HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. B-18

Sheet 1 of 1

2.47

DEPTH	ELEVATION	SAMPLES	SAMPLE NO.	CHEM. SMPL	RECOVERY (inches)	N	SOIL or ROCK CLASSIFICATION	UNIFIED SOIL CLASSIF.	DENSITY (PCF)	WATER CONTENT (Percent)	PERMEABILITY (cm/sec)	MONITOR PIEZOMETER CONSTRUCTION DETAILS B-19S	WATER PROBE READINGS Temp. (°C)	Cond. (µmho/cm)	Eh (mV)	pH	NOTES
0	100.8						0.0'										
							Stratified brown fine to coarse SAND and fine to coarse GRAVEL, Some Silt, cobbles										Monitor B-19S: Bottom of 2" PVC well at 19.0'. Screen 19.0'-9.0' (0.020" slot). Native backfill 19.0' to surface. Protective pipe at surface. PVC extends 2.7' above grade.
5																	
10																	
15							Grading wet at 15'										Water level 9.5' in monitor at completion of installation.
	81.8						19.0'										
20							BORING TERMINATED @ 19.0'										
25																	

NOTE: See reverse side for key and explanation to log.

RUN NO. | RECOVERY (Percent) | ROD

Surface Elevation 100.8
Date Started 5-9-83
Date Completed 5-9-83
Number of Installations in Boring 1
Method of Installation Hollow Stem Augers and Flush Joint Casing

Project No. GTA-82-17J
Project Title Oil Spill Containment
Location Pawling, New York
Classified By rga Checked

HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. B-19

Sheet 1 of 1

2-48

DEPTH	ELEVATION	SAMPLES	SAMPLE NO	CHEM. SMPL	RECOVERY	N	SOIL or ROCK CLASSIFICATION	UNIFIED SOIL CLASSIF.	DENSITY (PCF)	WATER CONTENT (Percent)	PERMEABILITY (cm/sec)	MONITOR, PIEZOMETER CONSTRUCTION DETAILS					WATER PROBE READINGS				NOTES
																	Temp. (°C)	Cond. (µmho cm)	Eh (mV)	pH	
1	2	3	4	5	6	7	8	9	10	11	12	13	14				15	16	17	18	19

The figures in the Column 1 defines the scale of the Subsurface Log.

The associated elevation is shown in the second column.

The third column graphically shows the exact depth range from which a soil sample or rock core was recovered.

See Table I for a description of the symbols used to signify the various types of samples.

The Sample or Run No. is used for identification on sample containers and/or Laboratory Test Reports.

The Chemical Sample column graphically shows the depth range from which a sample was removed for chemical analysis.

The recovery column shows the recovery in inches for a soil sample. Rock core recovery is shown in percent.

N shows the number of blows required to drive a split spoon sampler into the soil. Unless otherwise stated, the results are for a "Standard Penetration Test", driving a two-inch diameter spoon 12 inches with a 140 pound hammer dropped 30 inches. RQD is the Rock Quality Designation for rock core. This equals the sum of the length of pieces greater than 4 inches divided by the length of the core run.

All recovered soil samples are reviewed in the laboratory. The visual descriptions are made on basis of the sample as recovered and in accordance with the Unified Classification System shown on Table VI. The unified group symbol is shown in Column 9.

Guidelines for the terms used in descriptions are presented in Tables II and III. The description of the relative soil compactness or consistency is based upon the penetration records as defined in Table IV. The description of the soil moisture is based upon the condition of the sample as recovered. The moisture condition is described as dry, damp, moist or wet. Water used to advance the boring may have affected the in-situ moisture content of the sample. Special terms are used as required to describe materials in greater detail; several such terms are listed in Table V. When sampling gravelly soils with a standard two-inch diameter split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter. The presence of boulders and large gravel is sometimes, but not necessarily, detected by the evaluation of the casing and sampler blows or through the "action" of the drill rig as reported by the driller.

The results from nuclear field tests or laboratory tests for soil density and moisture are shown in Columns 11 and 12.

Soil or rock permeability, the testing method, and the depth range tested are shown in Column 12.

Column 13 is a graphic description of the monitor or piezometer installation. A Key to the description is presented on Table VII. Details of materials are noted in the NOTES column. The static water level (SWL) and date measured are noted in the adjacent column.

Columns 15 to 18 indicate the results of field tests at the depth tested. The date of the test is noted below the readings.

TABLE I

- Split Spoon Sample
- Shelby Tube Sample
- Auger or Pit Sample
- Rock Core

TABLE II

Identification of soil type is made on basis of an estimate of particle sizes, and in the case of fine grained soils also on basis of plasticity.

Soil Type	Soil Particle Size	
Boulder	>12"	
Cobble	3"-12"	
Gravel-Coarse	3"-3/4"	Coarse Grained (Granular)
-Fine	#4-#10	
Sand-Coarse	#10-#40	
-Medium	#40-#200	
-Fine		
Silt-Non Plastic (Granular)		
Clay-Plastic (Cohesive)	<#200	Fine Grained

TABLE III

The following terms are used in classifying soils consisting of mixtures of two or more soil types. The estimate is based on weight of total sample.

Term	Percent of Total Sample
and	35-50
some	20-35
little	10-20
trace	less than 10

(When sampling gravelly soils with a standard split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter.)

TABLE IV

The relative compactness or consistency is described in accordance with the following terms:

Granular Soils		Cohesive Soils	
Term	Blows per Foot, N	Term	Blows per Foot, N
Loose	<10	Very Soft	<2
Firm	11-30	Soft	3-5
Compact	31-50	Medium	6-15
Very Compact	>51	Stiff	16-25
		Hard	>25

(Large particles in the soils will often significantly influence the blows per foot recorded during the Penetration Test.)

TABLE V

Varved	Alternating layers, seams, and partings of soils.
Layer	Soil deposit more than 6" thick.
Seam	Soil deposit less than 6" thick.
Parting	Soil deposit less than 1/8" thick.
Uniform	All grains are of about the same diameter

TABLE VI

UNIFIED SOIL CLASSIFICATION

Major Division		Group Symbol	Soil Description
Coarse-grained (over 50% by weight coarser than No. 200 sieve)	Gravelly soils (over half of coarse fraction larger than No. 4)	GW	Well-graded gravels, sandy gravels. Little or no fines.
		GP	Gap-graded or uniform gravel, sandy gravels. Little or no fines.
		GM	Silty gravels, silty sandy gravels.
		GC	Clayey gravels, clayey sandy gravels.
	Sandy soils (over half of coarse fraction finer than No. 4	SW	Well-graded sand, gravelly sands. Little or no fines.
		SP	Gap-graded or uniform sands, gravelly sands. Little or no fines.
		SM	Silty sands, silty gravelly sands.
		SC	Clayey sands, clayey gravelly sands.
Fine-grained (over 50% by weight finer than No. 200 sieve)	Low compressibility (liquid limit less than 50)	ML	Silts, very fine sands, silty or clayey fine sands, rock flour.
		CL	Low plasticity clays, sandy or silty clays.
		OL	Low plasticity organic silts and clays.
	High compressibility (liquid limit more than 50)	MH	Micaceous or diatomaceous silts.
		CH	Highly plastic clays and sandy clays.
		OH	Organic silts and highly plastic clays.
Organic Soils			

TABLE VII

- Curb Box
- Riser
- Well Screen
- Point Piezometer
- Sand Pack
- Bentonite Seal
- Concrete Seal
- Granular Fill

2.49

2.50

DATE
STARTED 1-3-83
FINISHED 1-3-83
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC

SUBSURFACE LOG

HOLE NO 1
SURF ELEV 104.2
G W DEPTH See Note

PROJECT Oil Spill Investigation
Job No. GTA-82-17J

LOCATION Route 22, Pawling, NY
Dutchess County

DEPTH	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	BLOWS ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
0			9	25		32		Brown SILT with embedded fine SAND and fine to coarse GRAVEL, tree roots. (Moist-compact) 2.0'	No water in casing @ completion; no water in open hole 0730 hours 1-4-83.
		1	7	10					
			12	13		21			
		2	8	8				Brown fine to coarse SAND and fine to coarse GRAVEL, little to some silt, cobbles. (Moist-loose to firm) 9.0'	
5			6	5		10			
		3	5	8					
			4	3		5			
		4	2	4					
			6	7		45			
		5	38	35				Brown SILT with embedded ROCK FRAGMENTS and BOULDERS (glacial till). (Damp-compact)	
10			9	16		41			
		6	25	29					
		7	103						
			15	19		44			
15		8	25	30				Similar; moist	
		9	29	30					
20		10	20	50/.4				Similar; wet 21.0'	
								Boring terminated @ 21.0'. Auger refusal - possible bedrock or boulder.	
25									

N = No. blows to drive 2 spoon 12 with 140 lb pin wt falling 30 "per blow

C = No. blows to drive ____ casing ____ with ____ lb weight falling ____ "per blow

METHOD OF INVESTIGATION 3-1/4" I.D. Hollow stem auger casing

CLASSIFICATION Visual by geologist.

DATE
STARTED 1-3-83
FINISHED 1-3-83
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC

SUBSURFACE LOG

HOLE NO. 2
SURF ELEV 106.0
C. W DEPTH None at completion.

PROJECT Oil Spill Investigation
Job No. GTA-82-17G

LOCATION Route 22, Pawling, NY
Dutchess County

DEPTH	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6 6/12 12/18 N	BLOWS IN CASING	SOIL OR ROCK CLASSIFICATION	NOTES
0					TOPSOIL 0.1'	
					Brown fine SAND and fine to medium GRAVEL, little to some silt. (Moist-loose)	
5			4 4 8			
		1	4 6			
					10.5'	
10		2	25 50/.2		Brown SILT with embedded ROCK FRAGMENTS and BOULDERS (glacial till). (Moist-very compact)	
15		3	6 33 47 80			
					17.0'	
					Boring terminated @ 17.0' Auger refusal - possible bedrock or boulder.	
20						

N = No. blows to drive 2 spoon 12 with 140 lb pin wt falling 30 "per blow

C = No. blows to drive ____ casing ____ with ____ lb weight falling ____ per blow

CLASSIFICATION Visual by geologist

METHOD OF INVESTIGATION 3-1/4" I.D. hollow stem auger casing

DATE
STARTED 1-3-83
FINISHED 1-4-83
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC — SUBSURFACE LOG

HOLE NO 3
SURF ELEV 97.2
G W DEPTH See Note

PROJECT Oil Spill Investigation
Job No. GTA-82-17J

LOCATION Route 22, Pawling, NY
Dutchess County

DEPTH FEET	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0" / 6" / 12" / 18"	N	BLOW IN CASING	SOIL OR ROCK CLASSIFICATION	NOTES
0						TOPSOIL 0.7'	Water level 12.4' in casing at completion; water level 11.0' in casing 0730 hours 1-4-83
						Stratified brown fine to coarse SAND and fine to coarse GRAVEL; trace to some silt, cobbles (Moist-firm)	
5			4 / 5	12			
		1	7 / 3				
10							
		2	5 / 11	34 / 45		Wet at 12' ±	Hydrocarbon odor noted.
						15.0'	
15						Boring terminated @ 15.0'. Auger refusal - possible bedrock or boulder.	
						Installed 2" PVC monitor with bottom at 15.0'. Screened interval 15.0' - 6.0' (0.020" slotted screen). Riser extends 0.9' above grade.	

N = No. blows to drive 2 spoon 12 with 140 lb pin wt falling 30 per blow

C = No. blows to drive ____ casing ____ with ____ lb weight falling ____ per blow

SOIL DESCRIPTION 3-1/4" I.D. hollow stem auger casing

CLASSIFICATION Visual by geologist

DATE STARTED 1-4-83
FINISHED 1-4-83
SHEET ____ OF ____

EMPIRE SOILS INVESTIGATIONS INC — SUBSURFACE LOG

HOLE NO 4
SURF ELEV 101.7
G.W DEPTH None at completion

PROJECT Oil Spill Investigation
Job No. GTA-82-17J

LOCATION Route 22, Pawling, NY
Dutchess County

DEPTH	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER (0/6, 6/12, 12/18, N)	BLOWS ON CASING	SOIL OR ROCK CLASSIFICATION	NOTES
0					Stratified brown fine to coarse SAND and fine to coarse GRAVEL; trace to some silt, cobbles. (Moist-loose to firm)	
5		1	3 2 2	4		
10			2 7 9	12 21		
15			3 12 57		15.5'	
					Brown SILT with embedded ROCK FRAGMENTS and BOULDERS (glacial till) (Moist-very compact) 18.5'	
20					Boring terminated @ 18.5'. Auger refusal - possible bedrock or boulder.	

N = No. blows to drive 2 in. spoon 12 in. with 140 lb pin wt falling 30 in. per blow
CLASSIFICATION Visual by geologist

N' = No. blows to drive ____ in. casing ____ with ____ lb weight falling ____ in. per blow

METHOD OF INVESTIGATION 3-1/4" I.D. hollow stem auger casing

DATE
STARTED 1-4-82
FINISHED 1-4-82
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC — SUBSURFACE LOG

HOLE NO 5
SURF ELEV 100.9
G W DEPTH None at completion

PROJECT Oil Spill Investigation
Job No. GTA-82-17J

LOCATION Route 22, Pawling, NY
Dutchess County

DEPTH FEET	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	BLOWS ON CASING	SOIL OR ROCK CLASSIFICATION	NOTES
0								Stratified brown fine to coarse SAND and fine to coarse GRAVEL, cobbles, trace to little silt. (Moist-firm)	
5		1	5	9	11	12			
10		2	6	11	14	21			
15		3	5	19	41	31		17.5'	
20								Boring terminated @ 17.5'. Auger refusal - possible bedrock or boulder.	

N = No. blows to drive 2 spoon 12 with 140 lb pin wt falling 30 per blow

( ) = No. blows to drive ____ casing ____ with ____ lb weight falling ____ per blow

METHOD OF INVESTIGATION 3-1/4" I.D. hollow stem auger casing

CLASSIFICATION Visual by geologist

2.55

DATE
STARTED 1-4-83
FINISHED 1-4-83
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC — SUBSURFACE LOG

HOLE NO 6
SURF ELEV 89.5
G W DEPTH 10.2 at completion

PROJECT Oil Spill Investigation
Job No. GTA-82-17J

LOCATION Route 22, Pawling, NY
Dutchess County

DEPTH	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0" / 6" / 12" / 18"	N	BLOWS ON CASING	SOIL OR ROCK CLASSIFICATION	NOTES
0						TOPSOIL 0.5'	
						Stratified brown fine to coarse SAND and fine to coarse GRAVEL, cobbles, trace to little silt. (Moist-firm)	
5			4 / 6	12			
		1	6 / 6				
						Gravel layer 7' - 10'.	
10			2 / 2	4			
		2	2 / 2			Similar; saturated.	
15						16.5'	
		3	6 / 3	4 / 7		Boring terminated @ 16.5'	
20						Installed 2" PVC monitor with bottom at 12.5'. Screened interval 12.5' - 3.5' (0.020" slotted screen) Riser extends 0.9' above grade.	

No. blows to drive 2 spoon 12 with 140 lb pin wt falling 30 per blow

No. blows to drive ____ casing ____ with ____ lb weight falling ____ per blow

CLASSIFICATION Visual by geologist.

SPECIFICATIONS 3-1/4" I.D. hollow stem auger casing

2.56

DATE
STARTED 1-4-83
FINISHED 1-4-83
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC — **SUBSURFACE LOG**

HOLE NO 7
SURF ELEV 90.4
G. W DEPTH None at completion

PROJECT Oil Spill Investigation
Job No. GTA-82-17J

LOCATION Route 22, Pawling, NY
Dutchess County

DEPTH IN FEET	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6 6/12 12/18	BLOWS ON CASING	SOIL OR ROCK CLASSIFICATION	NOTES
0					Stratified brown fine to coarse SAND and fine to coarse GRAVEL, cobbles, trace to little silt. (Moist-firm)	
5		1	5 10 7 17			
10		2	4 4 8 12		Similar; wet. 14.0'	
15					Boring terminated @ 14.0'. Auger refusal - possible bedrock or boulder.	

N = No. blows to drive 2 in. spoon 12 with 140 lb pin wt. falling 30 per blow CLASSIFICATION Visual by geologist

C = No. blows for ___ in. core ___ with ___ lb weight falling ___ per blow

METHOD OF INVESTIGATION 3-1/4" I.D. hollow stem auger casing.

2.57

DATE
STARTED 1-4-83
FINISHED 1-4-83
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC — SUBSURFACE LOG

HOLE NO 8
SURF ELEV 93.4
G. W DEPTH None at completion

PROJECT Oil Spill Investigation
Job No. GTA-82-17J

LOCATION Route 22, Pawling, NY
Dutchess County

DEPTH FEET	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER (0 / 6 / 12 / 18)	BLOWS ON CASING	SOIL OR ROCK CLASSIFICATION	NOTES
0					Brown fine to coarse SAND and fine to coarse GRAVEL, little to some silt, cobbles. (Moist-loose to firm)	
5		1	4 4 4 8			
10		2	2 5 7 8 15		15'±	
15		3	20 46		Mixed glacial till and weathered rock. (Moist/wet-very compact) 17.0'	
20					Boring terminated @ 17.0'. Auger refusal - possible bedrock or boulder	

N = No. blows to drive 2 spoon 12 with 140 lb pin wt falling 30 per blow

C = No. blows to drive casing ___ with ___ lb weight falling ___ per blow

METHOD OF INVESTIGATION 3-1/4" I.D. hollow stem auger casing.

CLASSIFICATION Visual by geologist

DATE
STARTED 1-4-83
FINISHED 1-4-83
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC — SUBSURFACE LOG

HOLE NO 9
SURF ELEV 106.1
G.W DEPTH 28' in casing at completion

PROJECT Oil Spill Investigation
Job No. GTA-82-17J

LOCATION Route 22, Pawling, NY
Dutchess County

DEPTH	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER (0 / 6 / 12 / 18)	N	BLOWS ON CASING	SOIL OR ROCK CLASSIFICATION	NOTES
0						TOPSOIL 0.5'	
						Brown SILT and fine SAND. (Moist-loose)	
5		1	3 / 2	5			
			3 / 2				
10		2	3 / 5	13		11.0'	
			8			Stratified brown fine to coarse SAND and fine to coarse GRAVEL, trace to some silt, cobbles. (Moist-loose)	
15		3	2 / 4	6			
			2 / 4				
20		4	4 / 5	9		Similar; wet	
			4 / 9			23.5' ±	
25		5	8 / 10	30		Brown SILT with embedded GRAVEL and ROCK FRAGMENTS. (Wet-compact)	
			20 / 30			28.0'	
30						Boring terminated @ 28.0'. Auger refusal - possible bedrock or boulder.	

N = No. blows to drive 2 spoon 12 with 140 lb pin wt falling 30 per blow
C = No. blows to drive ____ casing ____ with ____ lb weight falling ____ per blow

CLASSIFICATION Visual by geologist

METHOD OF EXCAVATION 3-1/4" I.D. hollow stem auger casing

EMPIRE
SOILS INVESTIGATIONS INC

RQD - ROCK QUALITY DESIGNATION

after Deer, D.U. (1963)

"Technical Description of Rock Cores for Engineering Purposes",

Felsmechanik und Ingenieurgeologie, 1, 1, 16-22.

RQD - is a modified core recovery ratio (minimum core diameter - NX, 2 1/8" inch)

Method: Determine by considering only segments of core that are at least 4 inches long and are hard and sound.

Mechanical Breaks obviously caused by drilling are ignored. (These breaks are fresh and when the two pieces of core are fitted together they form a tight single piece.)

Measure the entire length of such segments, divide this sum by the length of core run and multiply by 100% (RQD is expressed as a percentage).

Example: A total of 2.5 feet of 4 inch plus pieces was recovered from Run #1.

Run #1 from 15.0' to 20.0'

$$RQD = \frac{2.5'}{5.0'} = 50\%$$

NOTE: Carefully examine core to distinquish differences between drilling breaks and natural fractures. Fractures will generally have some type of film or rust stains along the fracture surface. "Healed" fractures should also be considered a natural break in the rock if the mineral in the fracture is softer or weaker than the surrounding rock core.

APPENDIX C

Tabulated Water Level Data

2.61

EMPIRE SOILS INVESTIGATIONS, INC.

OBSERVATION WELL READINGS

METHOD of READING ELECTRIC PROBE

PROJECT Oil Spill Containment

LOCATION Pawling, New York

REFERENCE POINT (or MARK) Top of Well csg

DATE 9 May 1983 TIME _____ (Start)

Well No.	Depth	Ref. Elev.	Elev.
3	7.3	98.1	90.8
6	6.7	90.4	83.7
8R	9.7	93.2	83.5
11R	12.7	97.5	84.8
12R	15.7	101.1	85.4
13R	16.1	104.3	88.2
15	14.1	104.9	90.1
16	12.6	103.2	90.6
16R	12.7	103.0	90.3
18	14.7	103.5	88.8
18R	14.8	103.6	88.8
Marios	14.8	100.3	85.5
Surplus Store	23.4	103.6	80.2
Corral Ford	19.9	105.4	85.5

TIME _____ (Finish)

REFERENCE POINT (or MARK) _____

DATE _____ TIME _____ (Start)

Well No.	Depth	Ref. Elev.	Elev.

TIME _____ (Finish)

2.62-

EMPIRE SOILS INVESTIGATIONS, INC.

OBSERVATION WELL READINGS

PROJECT Oil Spill Containment

LOCATION Pawling, New York

METHOD of READING ELECTRIC PROBE

REFERENCE POINT (or MARK) Top of Well csg

DATE 19 May 1983 TIME 1000 (Start)

Well No.	Depth	Ref. Elev.	Elev.
3	8.5	98.1	89.6
6	7.7	90.4	82.7
8	10.7	93.4	82.7
8R	10.8	93.2	82.4
10	15.5	103.7	88.2
10R	15.2	103.7	88.5
11	12.0	97.1	85.1
11R	13.7	97.5	83.8
12R	16.7	101.1	84.4
13R	17.3	104.3	87.0
14	16.0	106.1	90.1
14R	16.2	106.2	90.0
15	15.2	104.9	89.7
16	13.6	103.2	89.6
16R	13.7	103.0	89.3
17	15.7	102.0	86.3
18	15.6	103.5	87.9
18R	15.7	103.6	87.9
19	18.3	103.5	85.3
Marios	15.7	100.3	84.6
Surplus Store	24.1	103.6	79.5
Corral Ford	21.8	105.4	83.6

TIME 1115 (Finish)

REFERENCE POINT (or MARK) _____

DATE _____ TIME _____ (Start)

Well No.	Depth	Ref. Elev.	Elev.

TIME _____ (Finish)

EMPIRE SOILS INVESTIGATIONS, INC.

OBSERVATION WELL READINGS

PROJECT Oil Spill Containment

LOCATION Pawling, New York

Readings by

METHOD of READING Camo Laboratories

REFERENCE POINT (or MARK) Top of Well csg

DATE 6/22-6/24/83 TIME _____ (Start)

Well No	Depth	Ref. Elev.	Elev.
3	Not Read	98.1	-----
6	10.00	90.4	80.40
8R	12.75	93.2	80.45
8	12.75	93.4	80.65
10R	17.25	103.7	86.45
10	DRY	103.7	-----
11R	16.50	97.5	81.00
11	DRY	97.1	-----
12R	18.50	101.1	82.60
13R	18.50	104.3	85.80
14R	18.08	106.2	88.12
14	18.00	106.1	88.10
15	DRY	104.9	-----
16R	16.50	103.0	86.50
16	15.67	103.2	87.53
17	17.08	102.0	84.92
18R	17.50	103.6	86.10
18	DRY	103.5	-----
19	19.67	103.5	83.83
Marios	Not Read	100.3	-----
Surplus Store	24.58	103.6	79.02
Corral Ford	23.00	105.4	82.40

TIME _____ (Finish)

REFERENCE POINT (or MARK) _____

DATE _____ TIME _____ (Sta

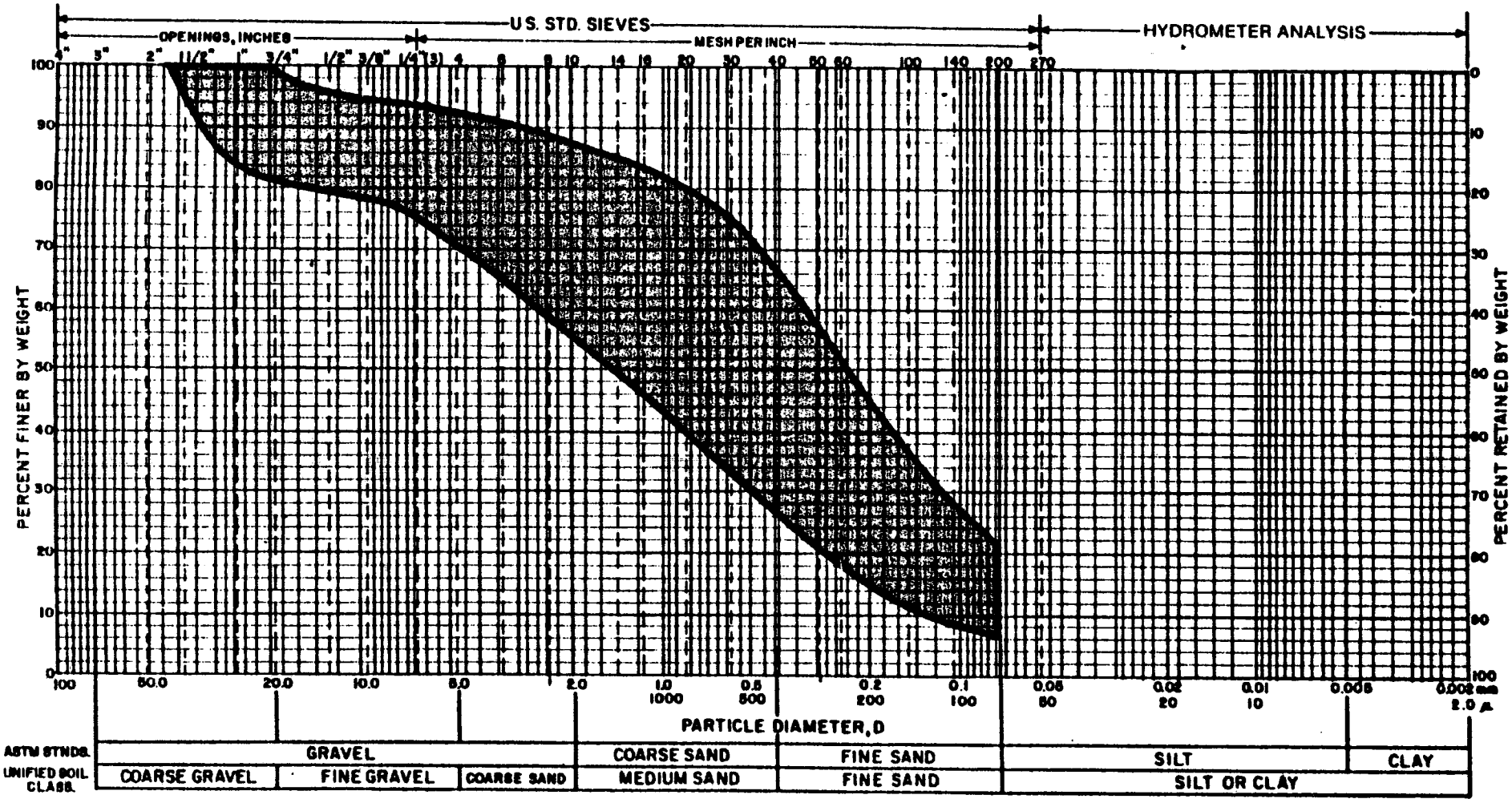
Well No	Depth	Ref. Elev.	Elev

TIME _____ (Finish)

APPENDIX D

Mechanical Analysis Results

GRAIN SIZE DISTRIBUTION CURVE



SAMPLE INFORMATION:

Shaded area represents approximate range of grain size distribution curves obtained from mechanical analyses of nine 2" O.D. X 1-3/8" I.D. split barrel samples recovered from test borings. For individual analysis results refer to tabulation following this figure.

NOTE: VISUAL SOIL CLASSIFICATIONS ON E.S.I. SUBSURFACE LOGS ARE BASED ON THE UNIFIED SOIL CLASSIFICATION SYSTEM.

EMPIRE SOILS INVESTIGATIONS INC

MECHANICAL ANALYSIS

OIL SPILL CONTAINMENT
PAWLING, NEW YORK

DR. BY:	CK'D.	DATE: 9/83	PROJ. NO. 82-17.1

2.65

APPENDIX E

Chemical Analysis Results

2.67

CAMO LABORATORIES

A DIVISION OF CAMO POLLUTION CONTROL, INC.

POUGHKEEPSIE AREA FACILITY
CAMO LABORATORY
367 VIOLET AVENUE
POUGHKEEPSIE, N.Y. 12601
(914) 473-9200

ROCHESTER AREA FACILITY
LOZIER/CAMO LABORATORY
23 NORTH MAIN STREET
FAIRPORT, N.Y. 14450
(716) 425-2210

July 13, 1983

New York State Department
of Transportation
4 Burnett Boulevard
Poughkeepsie, New York 12603

Attn: Mr. John Schaff

RE: Pawling, Dutchess County
Contract No.: D200177
Spill No.: 811902, PIN: SP1633.701
CAMO Log No.: 83-6-12457

Dear Sir:

CAMO Laboratories' personnel collected thirty (30) water samples June 22 - 24, 1983, with a request to analyze for DOT 602 Aromatics; the presence of gasoline.

All analyses were performed in accordance with The New York State Department of Health modified EPA 602 method "Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations", Federal Register, Monday, December 3, 1979.

The results of this analytical investigation are the subject of this report. If you have any questions, please feel free to call. Thank you.

Sincerely,

John P. Dullaghan
Director
Measurement Services

JPD:sas
Enclosures

CAMD Log No.: 83-6-12457

2.68

TABLE 1

AROMATICS

(DOT ADAPTED METHOD 602)

All results in ug/l unless noted otherwise

STAGNANT WELL WATER

COMPOUND	SAMPLE IDENTIFICATION				
	MW #1 B - 14s	MW #2 B - 14r	MW #3 B - 3s	MW #4 B - 15s*	MW #5 B - 16r
Benzene	<1	<1	63		220
Trichloroethylene	<1	<1	<1		1
Toluene	<1	<1	3900		1700
Tetrachloroethylene	<1	<1	<1		<1
Ethylbenzene	<1	<1	56		9
P-Xylene	<1	<1	230		9
M-Xylene	<1	<1	960		26
Chlorobenzene	<1	<1	<1		<1
O-Xylene	<1	<1	650		62
1,4,Dichlorobenzene	<1	<1	<1		<1
1,3,Dichlorobenzene	<1	<1	<1		<1
1,2,Dichlorobenzene	<1	<1	<1		<1
Presence of Gasoline	Not Present	Not Present	(Xylene ratio >2) Present		(Xylene ratio >2 Present

Presence of Gasoline Criteria: (A) - The presence of benzene, toluene, ethylbenzene and all three isomers of xylene. (B) - The xylene isomers present at approximately the same concentration (within a factor of 2).

*Sample Not Received, well dry at time of collection.

TABLE 1 - (Cont.)

AROMATICS

(DOT ADAPTED METHOD 602)

All results in ug/l unless noted otherwise

STAGNANT WELL WATER

COMPOUND	SAMPLE IDENTIFICATION				
	MW #6 B - 16s	MW #7 B - 13r	MW #8 B - 18r	MW #9 B - 18s*	MW #10 B - 10r
Benzene	<1	<1	10		<1
Trichloroethylene	2	<1	<1		<1
Toluene	2	<1	33		1.4
Tetrachloroethylene	1	<1	<1		<1
Ethylbenzene	<1	<1	<1		<1
P-Xylene	<1	<1	3		<1
M-Xylene	<1	<1	11		<1
Chlorobenzene	<1	<1	<1		<1
O-Xylene	<1	<1	10		<1
1,4,Dichlorobenzene	<1	<1	<1		<1
1,3,Dichlorobenzene	<1	<1	<1		<1
1,2,Dichlorobenzene	<1	<1	<1		<1
Presence of Gasoline	Not Present	Not Present	Not Present		Not Present

Presence of Gasoline Criteria: (A) - The presence of benzene, toluene, ethylbenzene and all three isomers of xylene. (B) - The xylene isomers present at approximately the same concentration (within a factor of 2).

*Sample Not Received, well dry at time of collection.

TABLE 1 - (Cont.)

AROMATICS

(DOT ADAPTED METHOD 602)

All results in ug/l unless noted otherwise

STAGNANT WELL WATER

COMPOUND	SAMPLE IDENTIFICATION				
	MW #11 B - 10s*	MW #12 B - 19s	MW #13 B - 17	MW #14 B -12r	MW #15 B - 11r
Benzene		<1	<1	<1	360
Trichloroethylene		<1	<1	<1	<1
Toluene		<1	<1	<1	100
Tetrachloroethylene		<1	<1	<1	<1
Ethylbenzene		<1	<1	<1	32
P-Xylene		<1	<1	<1	66
M-Xylene		<1	<1	<1	85
Chlorobenzene		<1	<1	<1	<1
O-Xylene		<1	<1	<1	350
1,4,Dichlorobenzene		<1	<1	<1	<1
1,3,Dichlorobenzene		<1	<1	<1	<1
1,2,Dichlorobenzene		<1	<1	<1	<1
Presence of Gasoline		Not Present	Not Present	Not Present	(Xylene ratio >2) Present

Presence of Gasoline Criteria: (A) - The presence of benzene, toluene, ethylbenzene and all three isomers of xylene. (B) - The xylene isomers present at approximately the same concentration (within a factor of 2).

*Sample Not Received, well dry at time of collection.

TABLE 1 - (Cont.)

AROMATICS

(DOT ADAPTED METHOD 602)

All results in ug/l unless noted otherwise

STAGNANT WELL WATER

COMPOUND	SAMPLE IDENTIFICATION				
	MW #16 B - 11s*	MW #17 B - 8r	MW #18 B - 8s	MW #19 B - 6s	Field Blank
Benzene		<1	<1	<1	<1
Trichloroethylene		<1	<1	1	<1
Toluene		<1	<1	<1	<1
Tetrachloroethylene		<1	<1	<1	<1
Ethylbenzene		<1	<1	<1	<1
P-Xylene		<1	<1	<1	<1
M-Xylene		<1	<1	<1	<1
Chlorobenzene		<1	<1	<1	<1
O-Xylene		<1	<1	1	<1
1,4,Dichlorobenzene		<1	<1	<1	<1
1,3,Dichlorobenzene		<1	<1	<1	<1
1,2,Dichlorobenzene		<1	<1	<1	<1
Presence of Gasoline		Not Present	Not Present	Not Present	Not Present

Presence of Gasoline Criteria: (A) - The presence of benzene, toluene, ethylbenzene and all three isomers of xylene. (B) - The xylene isomers present at approximately the same concentration (within a factor of 2).

*Sample Not Received, well dry at time of collection.

TABLE 2

2.71

AROMATICS

(DOT ADAPTED METHOD 602)

All results in ug/l unless noted otherwise

REGENERATED WELL WATER

COMPOUND	SAMPLE IDENTIFICATION				
	MW #1 B - 14s	MW #2 B - 14r	MW #3 B - 3s	MW #4 B - 15s*	MW #5 B - 16r
Benzene	<1	<1	440		220
Trichloroethylene	<1	<1	200		<1
Toluene	<1	<1	7100		1900
Tetrachloroethylene	<1	<1	<1		<1
Ethylbenzene	<1	<1	200		25
P-Xylene	<1	<1	300		14
M-Xylene	<1	<1	1200		20
Chlorobenzene	<1	<1	<1		<1
O-Xylene	<1	<1	780		38
1,4,Dichlorobenzene	<1	<1	350		14
1,3,Dichlorobenzene	<1	<1	75		3
1,2,Dichlorobenzene	<1	<1	35		4
Presence of Gasoline	Not Present	Not Present	(Xylene ratio >2) Present		(Xylene ratio >2) Present

Presence of Gasoline Criteria: (A) - The presence of benzene, toluene, ethylbenzene and all three isomers of xylene. (B) - The xylene isomers present at approximately the same concentration (within a factor of 2).

*Sample Not Received, well dry at time of collection.

TABLE 2 - (Cont.)

AROMATICS

(DOT ADAPTED METHOD 602)

All results in ug/l unless noted otherwise

REGENERATED WELL WATER

COMPOUND	SAMPLE IDENTIFICATION				
	MW #6 B - 16s	MW #7 B - 13r	MW #8 B - 18r	MW #9 B - 18s*	MW #10 B - 10
Benzene	<1	<1	<1		<1
Trichloroethylene	<1	<1	<1		<1
Toluene	<1	<1	4000		<1
Tetrachloroethylene	<1	<1	<1		<1
Ethylbenzene	<1	<1	290		<1
P-Xylene	<1	<1	70		<1
M-Xylene	<1	<1	5000		<1
Chlorobenzene	<1	<1	<1		<1
O-Xylene	<1	<1	320		<1
1,4,Dichlorobenzene	<1	<1	300		<1
1,3,Dichlorobenzene	<1	<1	130		<1
1,2,Dichlorobenzene	<1	<1	<1		<1
Presence of Gasoline	Not Present	Not Present	Not Present		Not Present

Presence of Gasoline Criteria: (A) - The presence of benzene, toluene, ethylbenzene and all three isomers of xylene. (B) - The xylene isomers present at approximately the same concentration (within a factor of 2).

*Sample Not Received, well dry at time of collection.

TABLE 2 - (Cont.)

AROMATICS

(DOT ADAPTED METHOD 602)

All results in ug/l unless noted otherwise

REGENERATED WELL WATER

COMPOUND	SAMPLE IDENTIFICATION				
	MW #11 B - 10s*	MW #12 B - 19s	MW #13 B - 17	MW #14 B - 12r	MW #15 B - 11r
Benzene		<1	<1	<1	520
Trichloroethylene		<1	1.4	<1	1
Toluene		<1	1	<1	100
Tetrachloroethylene		<1	23	<1	1
Ethylbenzene		<1	<1	<1	8.2
P-Xylene		<1	<1	<1	57
M-Xylene		<1	<1	<1	28
Chlorobenzene		<1	<1	<1	<1
O-Xylene		<1	<1	<1	510
1,4,Dichlorobenzene		<1	<1	<1	<1
1,3,Dichlorobenzene		<1	<1	<1	<1
1,2,Dichlorobenzene		<1	<1	<1	<1
Presence of Gasoline		Not Present	Not Present	Not Present	(Xylene ratio >2) Present

Presence of Gasoline Criteria: (A) - The presence of benzene, toluene, ethylbenzene and all three isomers of xylene. (B) - The xylene isomers present at approximately the same concentration (within a factor of 2).

*Sample Not Received, well dry at time of collection.

TABLE 2 - (Cont.)

AROMATICS

(DOT ADAPTED METHOD 602)

All results in ug/l unless noted otherwise

REGENERATED WELL WATER

COMPOUND	SAMPLE IDENTIFICATION				
	MW #16 B - 11s*	MW #17 B - 8r	MW #18 B - 8s	MW #19 B - 6s	Field Blank
Benzene		<1	<1	<1	<1
Trichloroethylene		<1	<1	<1	<1
Toluene		<1	<1	1	<1
Tetrachloroethylene		<1	<1	2	<1
Ethylbenzene		<1	<1	<1	<1
P-Xylene		<1	<1	1	<1
M-Xylene		<1	<1	<1	<1
Chlorobenzene		<1	<1	<1	<1
O-Xylene		<1	<1	<1	<1
1,4,Dichlorobenzene		<1	<1	<1	<1
1,3,Dichlorobenzene		<1	<1	<1	<1
1,2,Dichlorobenzene		<1	<1	<1	<1
Presence of Gasoline		Not Present	Not Present	Not Present	Not Present

Presence of Gasoline Criteria: (A) - The presence of benzene, toluene, ethylbenzene and all three isomers of xylene. (B) - The xylene isomers present at approximately the same concentration (within a factor of 2).

*Sample Not Received, well dry at time of collection.

TABLE 3

N.Y.S. D.O.T. - Pawling, New York Project

Well Measurements

Well Number	Well Depth	Static Water Level	Height of Water Column
B-14s	23'	18'	5'
B-14r	35'	18'1"	16'11"
B-3s	Not Recorded		
B-15s	16'	16'	0
B-16r	35'	16'6"	18'6"
B-16s	16'6"	15'8"	8"
B-13r	26'6"	18'6"	7'6"
B-18r	16'6"	16'6"	0
B-18s	25'	17'6"	7'6"
B-10r	38'	17'3"	20'9"
B-10s	Dry		
B-19s	21'	19'8"	1'4"
B-17	19'	17'1"	1'11"
B-12r	23'6"	18'6"	5'
B-11r	32'	16'6"	15'6"
B-11s	11'9"	11'9"	0
B-8r	35'11"	12'9"	23'2"
B-8s	14'6"	12'9"	1'9"
B-6s	13'	10'	3'

Ref. 3.1

THOMSEN ASSOCIATES

January 17, 1984

New York State Department
of Transportation
4 Burnett Boulevard
Poughkeepsie, New York 12603

Attention: John Schaff
Assistant Regional Oil Spill Engineer

Reference: Hydrocarbon Spill
Pawling, Dutchess County, New York
Spill No. 811902
P.I.N. SP 1633.701
Empire File GTA-82-17J
SUPPLEMENTAL HYDROGEOLOGIC EVALUATIONS
LETTER REPORT

Gentlemen:

This correspondence is intended to summarize hydrogeologic evaluations by Empire-Thomsen supplemental to our formal report dated October 24, 1983, previously submitted to your office.

In the wake of heavy rainfall in eastern New York State on December 12-14, 1983, the writer returned to the referenced spill site on December 17, 1983 to obtain additional hydrogeologic data. It was anticipated that the heavy precipitation would result in a rise of the water table at this site, of sufficient magnitude to permit groundwater sampling of a key monitoring well, B-15, which was dry at the time of earlier sampling in June, 1983.

Water level readings were obtained on December 17, 1983 in all monitors with the exception of B-6, which had been destroyed. This water level data, presented on the attached tabulation sheet, was used to contour the water table in the project area on the date of readings, as illustrated on Drawing No. 7, attached. This drawing indicates the hydrogeologic regime at this site on December 17, 1983 to be essentially the same as that detailed in Empire-Thomsen's October, 1983 report. Overall groundwater flow in the area is in a southward to southwestward direction, as shown by the arrows on Drawing No. 7. Groundwater monitor cluster B-14 lies upgradient of the Amoco station, while monitor B-15 is located downgradient of those facilities.

Comparison of specific water level determinations in the monitors on December 17 with similar data for the chemical sampling dates in June, 1983 (presented in our formal report) indicates the water table to be generally one (1) to three (3) feet higher in elevation on December 17. As a result of this overall rise of the water table, groundwater was present in monitor B-15 on December 17, 1983.

Grab samples of groundwater were obtained by the writer on December 17 from the surface of the "standing" water column in the following monitors:

B-3	B-16 (B-16 Shallow)
B-11R (B-11 Deep)	B-16R (B-16 Deep)
B-13R	B-17
B-14 (B-14 Shallow)	B-18 (B-18 Shallow)
B-15	B-18R (B-18 Deep)

These grab samples were recovered prior to obtaining water level data in the monitors, in order to eliminate potential cross-contamination via the well probe used for water level determinations.

Groundwater samples were obtained through the use of 40 milliliter septum vials immersed several times in the upper portion of the water column in each monitor, allowing recovery of sufficient sample volume to fill a duplicate vial and eliminate vapor bubbles from that duplicate receptacle. Sample retrieval vials were not reused; two new, clean vials were employed for sample recovery and preservation at each sampling point. All samples remained under refrigeration in the custody of Thomsen Associates until their delivery on December 19, 1983 to Galson Technical Services, Inc., East Syracuse, New York.

In addition to the ten groundwater samples obtained, a "blank", consisting of distilled water, was prepared and kept with the samples at all times.

Following authorization from your office, samples from selected monitors, including those wells screened over the water table in the vicinity of the Amoco station (B-14 and B-15), were analyzed by Galson Technical Services, Inc. for concentrations of benzene, toluene, xylene and total hydrocarbons exclusive of these three components. Analysis results have been furnished to your office directly under separate cover by the testing agency; a copy of these results is attached to this letter.

THOMSEN ASSOCIATES

The sample from monitoring well B-14, upgradient of the Amoco station, contained less than one microgram per liter (ug/l) of each of the parameters analyzed. However, monitor B-15, downgradient of Amoco, exhibited hydrocarbon contamination of groundwater identified by the analytical laboratory as "gasoline".

These chemical analysis results, in conjunction with the configuration of the water table over the site on the date of sampling, indicate a hydrocarbon (gasoline) contamination plume emanating from the active Amoco station in the project area.

The results discussed above are in agreement with, and collectively corroborate, Empire-Thomsen's previous findings relating to this investigation.

We trust that this additional information is of assistance to your office in efforts to remediate this hydrocarbon spill.

Should you have any questions, comments or additional input in this regard, please contact the writer at your convenience.

Respectfully submitted,

THOMSEN ASSOCIATES

Ronald Ausburn

Ronald Ausburn, CPGS
Project Manager

EMPIRE SOIL INVESTIGATIONS INC.

OBSERVATION WELL READINGS

PROJECT Oil Spill Containment

LOCATION Pawling, N.Y.

METHOD of READING Electric Well Probe

REFERENCE POINT (or MARK) Top of PVC Casing

DATE 17 December 83 TIME 0830 (Start)

Well No.	Depth	Ref. Elev.	Elev.
3	8.6	98.1	89.5
6	DESTROYED	---	---
8	10.4	93.4	83.0
8R	10.7	93.2	82.5
10	15.5	103.7	88.2
10R	14.9	103.7	88.8
11	DRY	---	---
11R	13.5	97.5	84.0
12R	16.5	101.1	84.6
13R	16.7	104.3	87.6
14	16.2	106.1	89.9
14R	16.3	106.2	89.9
15	15.4	104.9	89.5
16	13.8	103.2	89.4
16R	14.0	103.0	89.0
17	15.8	102.0	86.2
18	15.8	103.5	87.7
18R	15.9	103.6	87.7
19	17.2	103.5	86.3

TIME 1130 (Finish)

REFERENCE POINT (or MARK) _____

DATE _____ TIME _____ (Start)

Well No.	Depth	Ref. Elev.	Elev.

TIME _____ (Finish)

3.5

Galson
Technical Services, Inc.
6601 Kirkville Road
Post Office Box 546
E. Syracuse, N.Y. 13057
Tel: (315) 432-0506

Environmental Sciences
Division

January 9, 1984

Mr. John Schaff
Asst. Regional Oil Spill Engineer
N.Y.S. Dept. of Transportation, Region 8
4 Burnett Blvd.
Poughkeepsie, NY 12603

RE: GTS #G1-047

Dear Mr. Schaff:

Enclosed are the results of the analyses performed on the samples we received from Empire Soils on December 19, 1983.

Originally, you authorized us to analyze only samples B-14 and B-15.

On December 29, 1983, you told us also to analyze B-3, B-11-deep, B-16-deep, B-18-deep, and B-18-shallow. We also did B-16-shallow.

Of the set, only B-15 definitely contained gasoline. B-11-deep had a pattern of early eluting peaks that did not match gasoline. B-16-deep had only a single large peak. The shallow wells had miscellaneous small peaks.

If you have any questions concerning our results, please feel free to call.

Sincerely,

GALSON TECHNICAL SERVICES, INC.

Eva Galson
Laboratory Director

EG/sl

Enclosure

xc: Ron Ausburn, Empire Thompsen

Galson
Technical Services, Inc.
6601 Kirkville Road
Post Office Box 546
E. Syracuse, N.Y. 13057
Tel: (315) 432-0506

LABORATORY ANALYSIS REPORT

Client: EMPIRE SOILS INVES. Job Number: G1-047
Task Number: 83121901
Location: PAWLING, NY Date Sampled: 12/17/83

SPILL: 811902
PIN: SP1633.701

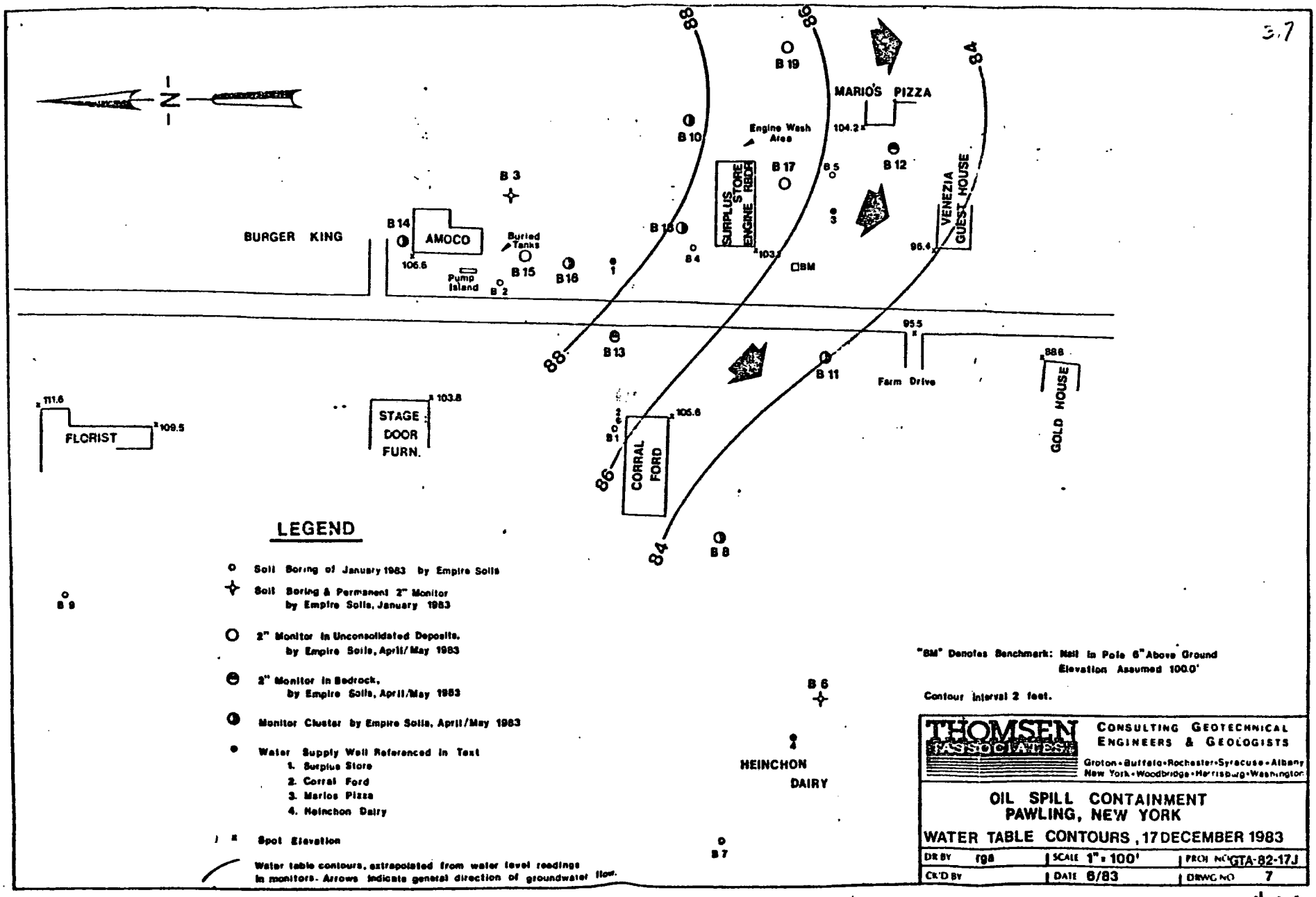
BENZENE, TOLUENE, XYLENE, THC IN WATER

SAMPLE ID	GTS #	BENZENE (ug/l)	TOLUENE (ug/l)	XYLENE (ug/l)	*TOTAL HYDROCARBONS (ug/l)
WELL B-3	A17281	<1	<1	<1	7
WELL B-11 DEEP	A17282	<1	<1	1	701
WELL B-16 SHALLOW	A17285	<1	<1	<1	7
WELL B-18 SHALLOW	A17288	<1	<1	<1	2
WELL B-14 SHALLOW	A17283	<1	<1	<1	<1
WELL B-15	A17284	91	2870	1610	6690
WELL B-16 DEEP	8268	<1	<1	<1	123
WELL B-18 DEEP	A17287	<1	<1	<1	11
BLANK	A17289	<1	<1	<1	<1
WELL B-17	A17286	NOT ANALYZED	NA	NA	NA
WELL B-13	A17290	NOT ANALYZED	NA	NA	NA

(<) LESS THAN
(>) GREATER THAN
NA - NOT APPLICABLE
ND - NOT DETECTABLE
NS - NOT SPECIFIED

Footnotes: *Other than benzene, toluene, xylene, quantified as heptane.

Submitted by: J Dz Di/6
Approved by:
Date: 1/9/84



LEGEND

- Soil Boring of January 1983 by Empire Soils
- Soil Boring & Permanent 2" Monitor by Empire Soils, January 1983
- 2" Monitor in Unconsolidated Deposits, by Empire Soils, April/May 1983
- 2" Monitor in Bedrock, by Empire Soils, April/May 1983
- Monitor Cluster by Empire Soils, April/May 1983
- Water Supply Well Referenced in Text
  1. Surplus Store
  2. Corral Ford
  3. Marios Pizza
  4. Heinchon Dairy
- Spot Elevation
- Water table contours, extrapolated from water level readings in monitors. Arrows indicate general direction of groundwater flow.

"BM" Denotes Benchmark: Nail in Pole 6" Above Ground Elevation Assumed 100.0'

Contour interval 2 feet.

THOMSEN ASSOCIATES

CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

Groton • Buffalo • Rochester • Syracuse • Albany
New York • Woodbridge • Harrisburg • Washington

OIL SPILL CONTAINMENT
PAWLING, NEW YORK
WATER TABLE CONTOURS, 17 DECEMBER 1983

DR BY rga	SCALE 1" = 100'	PROJ NO GTA-82-17J
CK'D BY	DATE 6/83	DRWG NO 7

Ref. 4

(47-15-11 (10/83)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF SOLID AND HAZARDOUS WASTE

INACTIVE HAZARDOUS WASTE DISPOSAL SITE REPORT

PRIORITY CODE: 2a SITE CODE: 314060

NAME OF SITE: NYSDOT Spill No. 811902 REGION: 3

STREET ADDRESS: Route 22

TOWN/CITY: Pawling COUNTY: Dutchess

NAME OF CURRENT OWNER OF SITE: Jay Maxwell

ADDRESS OF CURRENT OWNER OF SITE: Maxwell Engine Rebuilders, Rt. 22, Pawling

TYPE OF SITE: OPEN DUMP [X] STRUCTURE [ ] LAGOON [ ]
LANDFILL [ ] TREATMENT POND [ ]

ESTIMATED SIZE: 20 ACRES

SITE DESCRIPTION:

Commercial area along Route 22, north of Brady Brook and south of Akindale Rd., just north of town line of Patterson in Putnam County.

The following parcels, whose wells were tested, indicate gasoline present in well:

1) Maxwell Engine Rebuilders
2) Inex Venezia, guest house
3) Corral Ford
4) Heinchon Dairy
5) Mario's Pizza

HAZARDOUS WASTE DISPOSED: CONFIRMED [X] SUSPECTED [ ]

TYPE AND QUANTITY OF HAZARDOUS WASTES DISPOSED:

TYPE	QUANTITY (POUNDS, DRUMS, TONS, GALLONS)
Benzene	
Toluene	
M-xylene	
O-xylene.	
Ethyl benzene	
Tetrachloroethylene	

TIME PERIOD SITE WAS USED FOR HAZARDOUS WASTE DISPOSAL:

_____, 19 ___ TO _____, 19 ___

OWNER(S) DURING PERIOD OF USE: _____

SITE OPERATOR DURING PERIOD OF USE: _____

ADDRESS OF SITE OPERATOR: _____

ANALYTICAL DATA AVAILABLE: AIR ☐ SURFACE WATER ☐ GROUNDWATER [X]
SOIL ☐ SEDIMENT ☐ NONE ☐

CONTRAVENTION OF STANDARDS: GROUNDWATER ☐ DRINKING WATER [X]
SURFACE WATER ☐ AIR ☐

SOIL TYPE: _____

DEPTH TO GROUNDWATER TABLE: _____

LEGAL ACTION: TYPE: _____ STATE ☐ FEDERAL ☐
STATUS: IN PROGRESS ☐ COMPLETED ☐
REMEDIAL ACTION: PROPOSED ☐ UNDER DESIGN ☐
IN PROGRESS ☐ COMPLETED ☐
NATURE OF ACTION: _____

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

Chemicals in private wells and groundwater.

ASSESSMENT OF HEALTH PROBLEMS:

INSUFFICIENT INFORMATION

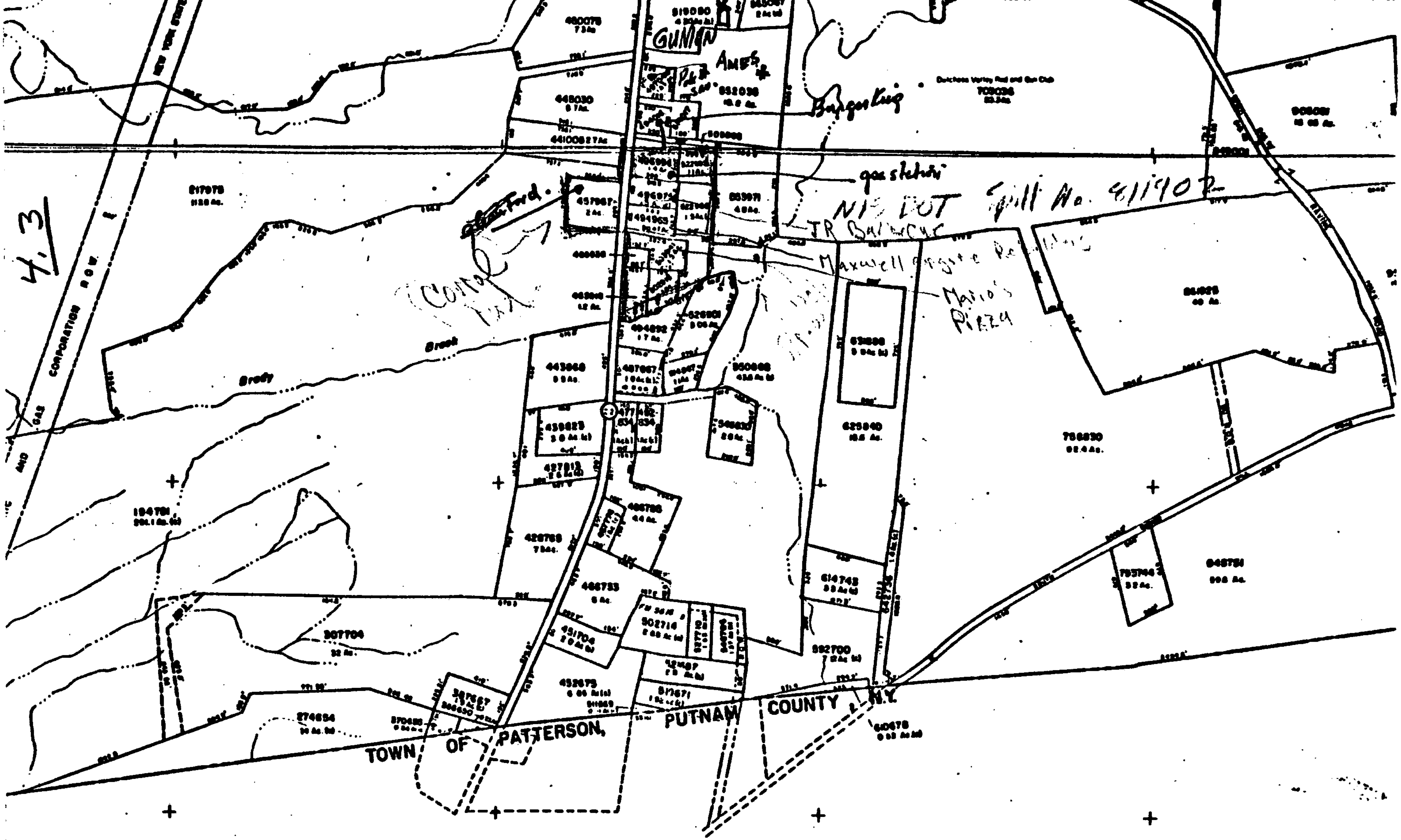
PERSON(S) COMPLETING THIS FORM:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NAME A. Woodard
TITLE SWMS
NAME R.A. Olazagasti
TITLE SWMS
DATE: 12/83

NEW YORK STATE DEPARTMENT OF HEALTH

NAME Ronald Tramontano
TITLE Bur. Tox. Subst. Assess.
NAME
TITLE
DATE: 12/83


4.3
CORPORATION R.O.W.
NEW YORK STATE
Brady Brook
GUMAN
AMES
Burger King
Dutchess Valley Rod and Gun Club
gas station
NYS DOT Spill No. 8111907
JR Barnacle
Maxwell
Mario's Pizza
Ford
TOWN OF PATTERSON, PUTNAM COUNTY N.Y.

1" = 400'

Ref. 5.1

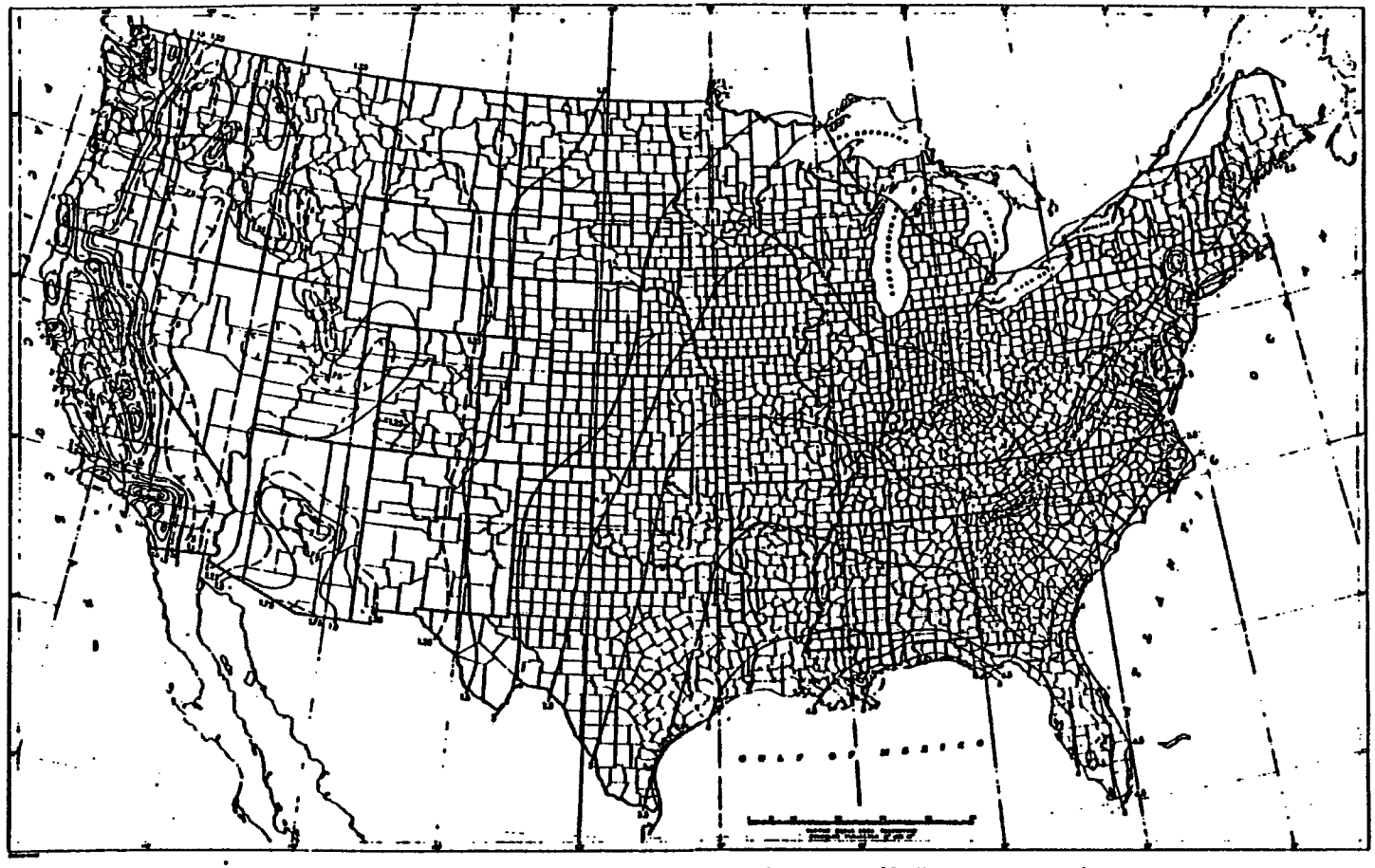
Uncontrolled Hazardous Waste Site Ranking System

A Users Manual
(HW-10)

Originally Published in
the July 16, 1982, *Federal Register*

United States
Environmental Protection
Agency

1984



Source: Rainfall Frequency Atlas of the United States, Technical Paper No. 40, U.S. Department of Commerce, U.S. Government Printing Office, Washington, D.C., 1963.

FIGURE 8
1-YEAR 24-HOUR RAINFALL
(INCHES)

TABLE 2

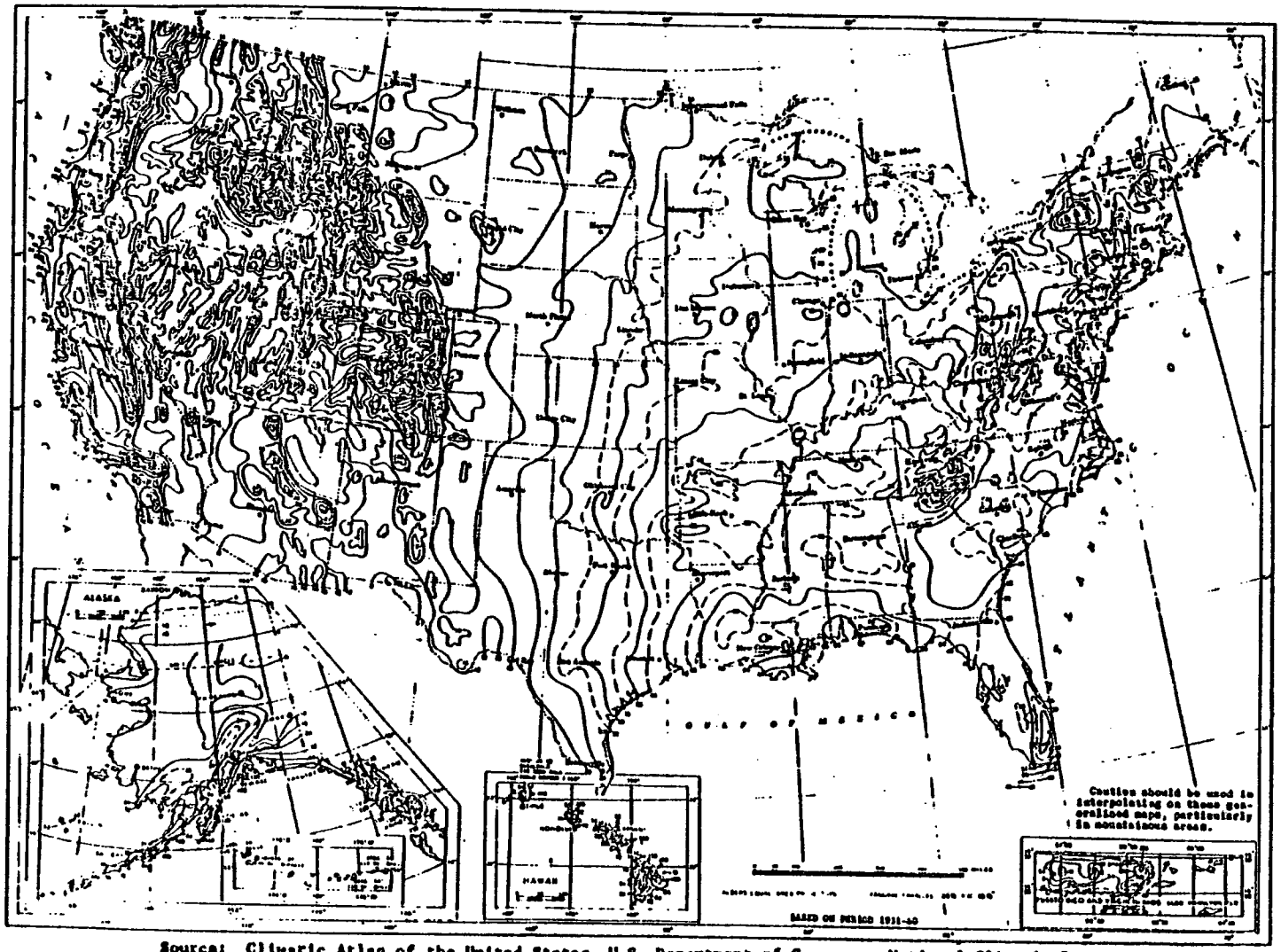
PERMEABILITY OF GEOLOGIC MATERIALS*

Type of Material	Approximate Range of Hydraulic Conductivity	Assigned Value
Clay, compact till, shale; unfractured metamorphic and igneous rocks	$<10^{-7}$ cm/sec	0
Silt, loess, silty clays, silty loams, clay loams; less permeable limestone, dolomites, and sandstone; moderately permeable till	$10^{-5} - 10^{-7}$ cm/sec	1
Fine sand and silty sand; sandy loams; loamy sands; moderately permeable limestone, dolomites, and sandstone (no karst); moderately fractured igneous and metamorphic rocks, some coarse till	$10^{-3} - 10^{-5}$ cm/sec	2
Gravel, sand; highly fractured igneous and metamorphic rocks; permeable basalt and lavas; karst limestone and dolomite	$>10^{-3}$ cm/sec	3

*Derived from:

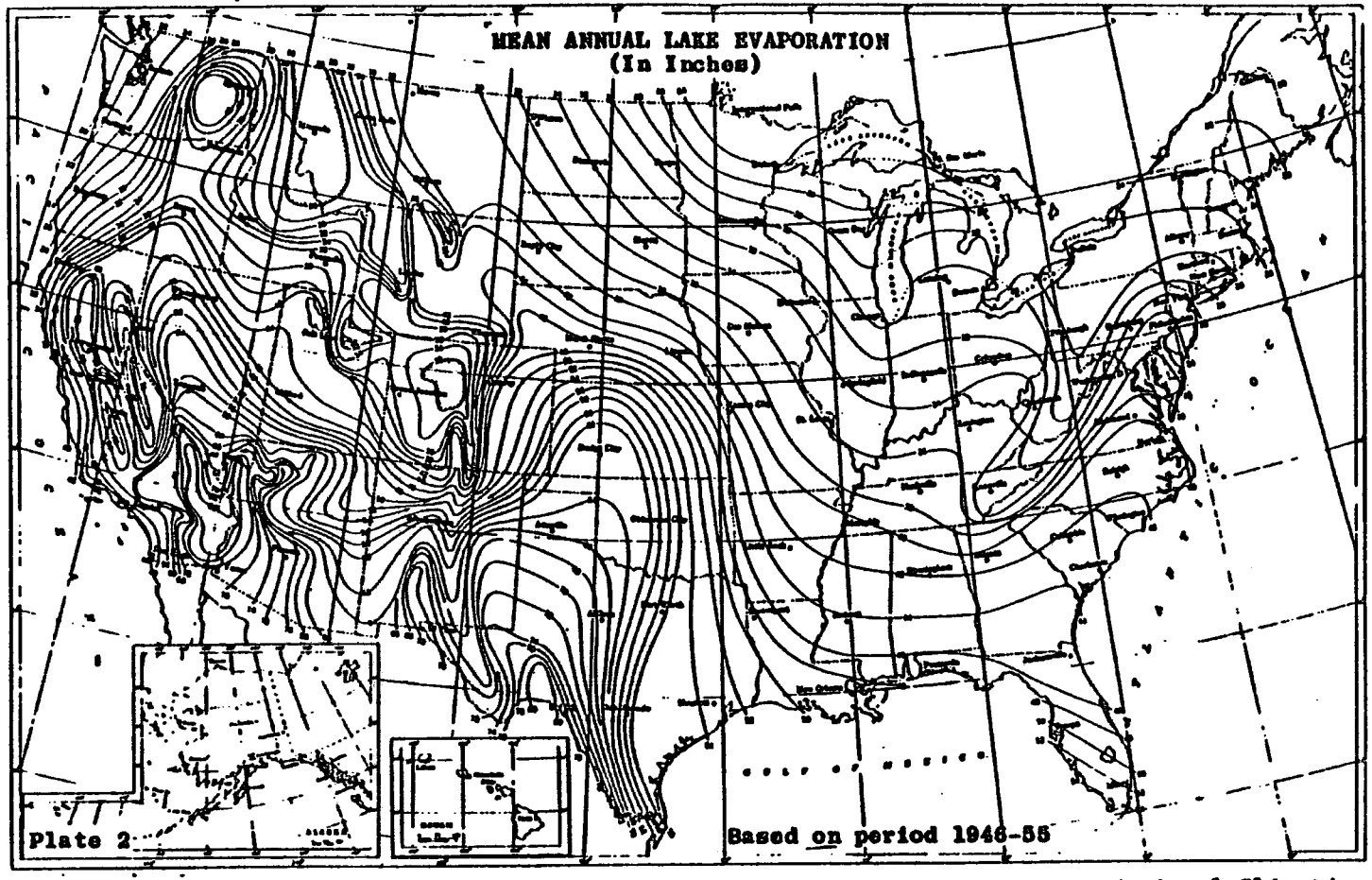
Davis, S. N., Porosity and Permeability of Natural Materials in Flow-Through Porous Media, R.J.M. DeWest ed., Academic Press, New York, 1969

Freeze, R.A. and J.A. Cherry, Groundwater, Prentice-Hall, Inc., New York, 1979



Source: Climatic Atlas of the United States, U.S. Department of Commerce, National Climatic Center, Ashville, N.C., 1979.

FIGURE 5
NORMAL ANNUAL TOTAL PRECIPITATION (INCHES)



Source: Climatic Atlas of the United States, U.S. Department of Commerce, National Climatic Center, Ashville, N.C., 1979.

FIGURE 4
MEAN ANNUAL LAKE EVAPORATION
(IN INCHES)

SUPERFUND
NATIONAL PRIORITIES LIST SEMINAR
EPA REGION II
ALBANY, NY

The MITRE Corporation

April 2-3, 1986

45

Observed Release

The release and the background well must be in the same aquifer at comparable elevations.

Knowledge of flow gradients helps in determining where to look for background versus contamination...but beware of local or seasonal variation. The purpose is to find a nearby well in the aquifer of concern that is not under the influence of the site.

Background well(s) must discriminate out any alternative sources of the contamination.

The attribution of the release to the facility is strengthened if the substances found in the release are documented to have been deposited at the facility.

Depth of the Aquifer of Concern (Page 12)

- Distance between the deepest point of known contamination and the top of the aquifer of concern.
  - Deepest level at which contamination is documented.
  - Highest seasonal level of the saturated zone of the aquifer.
- If depth of deposit is unknown, 6 feet may be assumed.

Reference 6.1

STATE OF NEW YORK

OFFICIAL COMPILATION

OF

CODES, RULES AND REGULATIONS

MARIO M. CUOMO
Governor

GAIL S. SHAFFER
Secretary of State

Published by
DEPARTMENT OF STATE
162 Washington Avenue
Albany, New York 12231

1/83

2634 CN 11-16-66

397 CN 8-30-74

than ±0 mg/L.

Note 1: Refer to Note 1 under Class "AA" which is also applicable to Class "B" standards.

CLASS "C"

Best usage of waters. Suitable for fishing and all other uses except as a source of water supply for drinking, culinary or food processing purposes and primary contact recreation.

TABLE I (contd.)

Item No.	Waters Index Number	Name	Comments	Map Ref. No.	Class	Standards
346	H-31-P 44-24-31-1a-P 102a	Subtrib. of East Branch Croton River		0-25se	B	B
347	H-31-P 44-24-31-P 102b	Subtrib. of East Branch Croton River		0-25sw	B	B
348	H-31-P 44-24-31-P 89o	Ballard Pond		0- 25sw	B	B
349	H-31-P 44-24-32 portion	Brady Brook	From mouth to trib. 5.	0-25se	C	C(T)
350	H-31-P 44-24-32 portion	Brady Brook	From trib. 5 to source.	0-25se	D	D
351	H-31-P 44-24-32-2,3,5	Tribs. of Brady Brook		0-25se	C	C(T)
352	H-31-P 44-24-32-3-P 89p	Subtrib. of Brady Brook		0-25se	D	D
353	H-31-P 44-24-32-5-P 89q	Subtrib. of Brady Brook		0-25se	D	D
354	H-31-P 44-24-32-6,8,9,10,12,13,15 and tribs. 8-1,8-2, 8-P 89x,10-P 89r	Tribs. of Brady Brook and subtribs.		0-25se	D	D

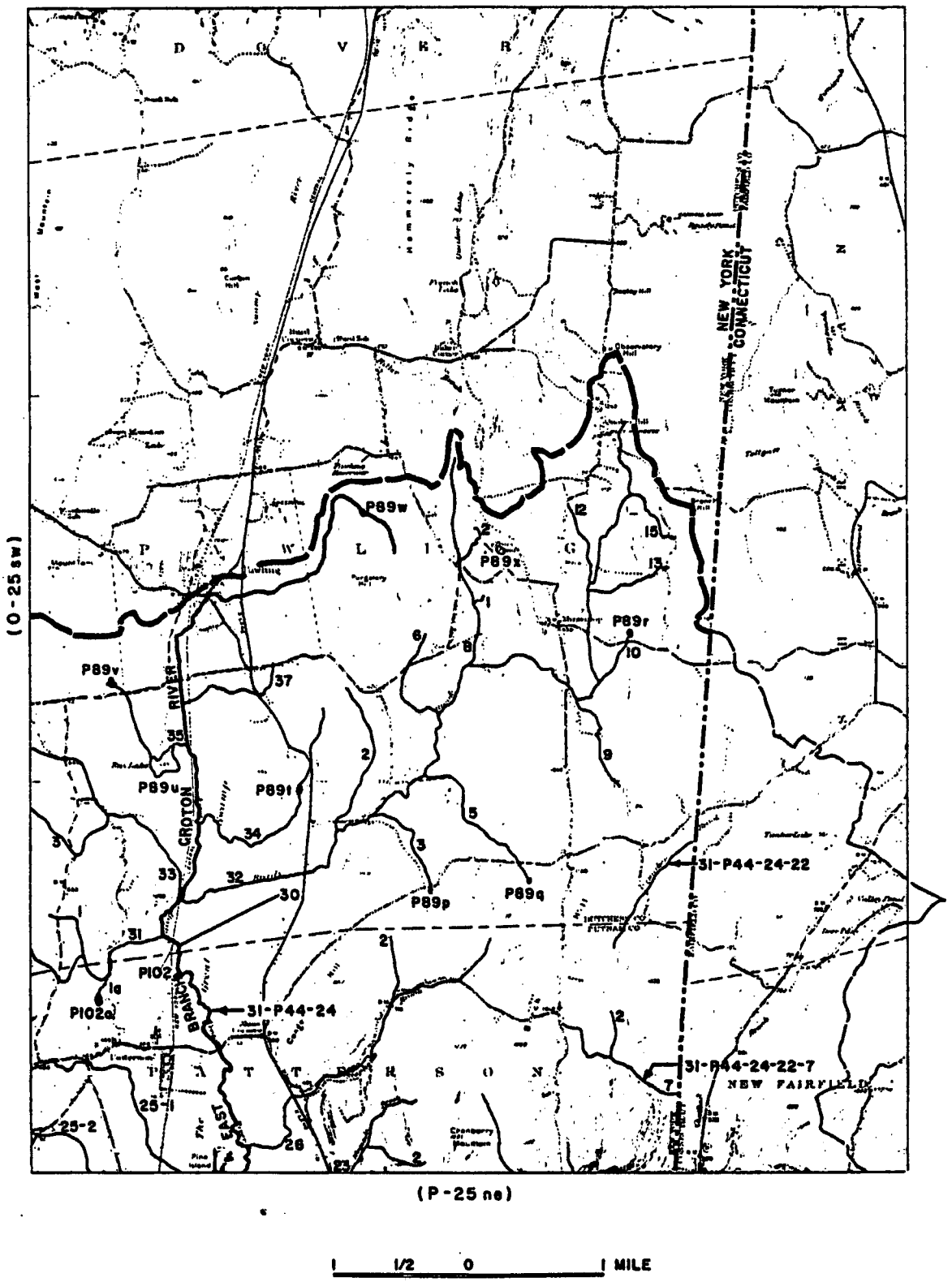
6.2

TABLE I *(cont'd)*

Item No.	Waters Index Number	Name	Description	Map Ref. No.	Class	Standards
280	H-31-P 44-23-5-P 80	Black Pond		0-24se	B	B
281	H-31-P 44-23-P 76j	Sagamore Lake		P-24ne	B	B
282	H-31-P 44-23-8,9, 10 and tribs. 8-1, 8-1a,8-1b,8-1b-P 76K	Tribs. of West Branch Croton River and subtribs.		P-24ne	D	D
283	H-31-P 44-24 portion	East Branch Croton River	From mouth to P 89 (East Branch Reservoir).	P-25sw P-25nw P-25ne	A	A(T)
284	H-31-P 44-24 portion	East Branch Croton River	From P 89 (East Branch Reservoir) to trib. 16.	P-25ne	A	A
285	H-31-P 44-24 portion	* East Branch Croton River	From trib. 16 to Pawling.	P-25ne 0-25se	C	C(T)
286	H-31-P 44-24 portion	East Branch Croton River	From Pawling to source.	0-25se	D	D
287	H-31-P 44-24-1 portion	Holly Stream	From mouth to trib. 3. Parts not in New York City-owned lands.	P-25sw P-25nw P-25se	C	C
288	H-31-P 44-24-1 portion	Trib. of East Branch Croton River	From trib. 3 to source.	P-25se	C	C

6.14

PAWLING QUADRANGLE



MAP O-25 se

Ref. 7.1

SIGNIFICANT HABITAT OVERLAY NO. 2 OF 2

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF FISH AND WILDLIFE

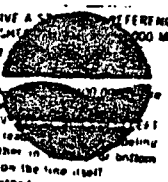
BUREAU OF WILDLIFE

PREPARED FOR: SIGNIFICANT HABITAT UNIT
WILDLIFE RESOURCES CENTER
DELMAR, NEW YORK 12054
(518)-457-5782

PREPARED BY: HABITAT INVENTORY UNIT

GRID ZONE DESIGNATION: LST

WB	XB	YB
WA	XA	YA

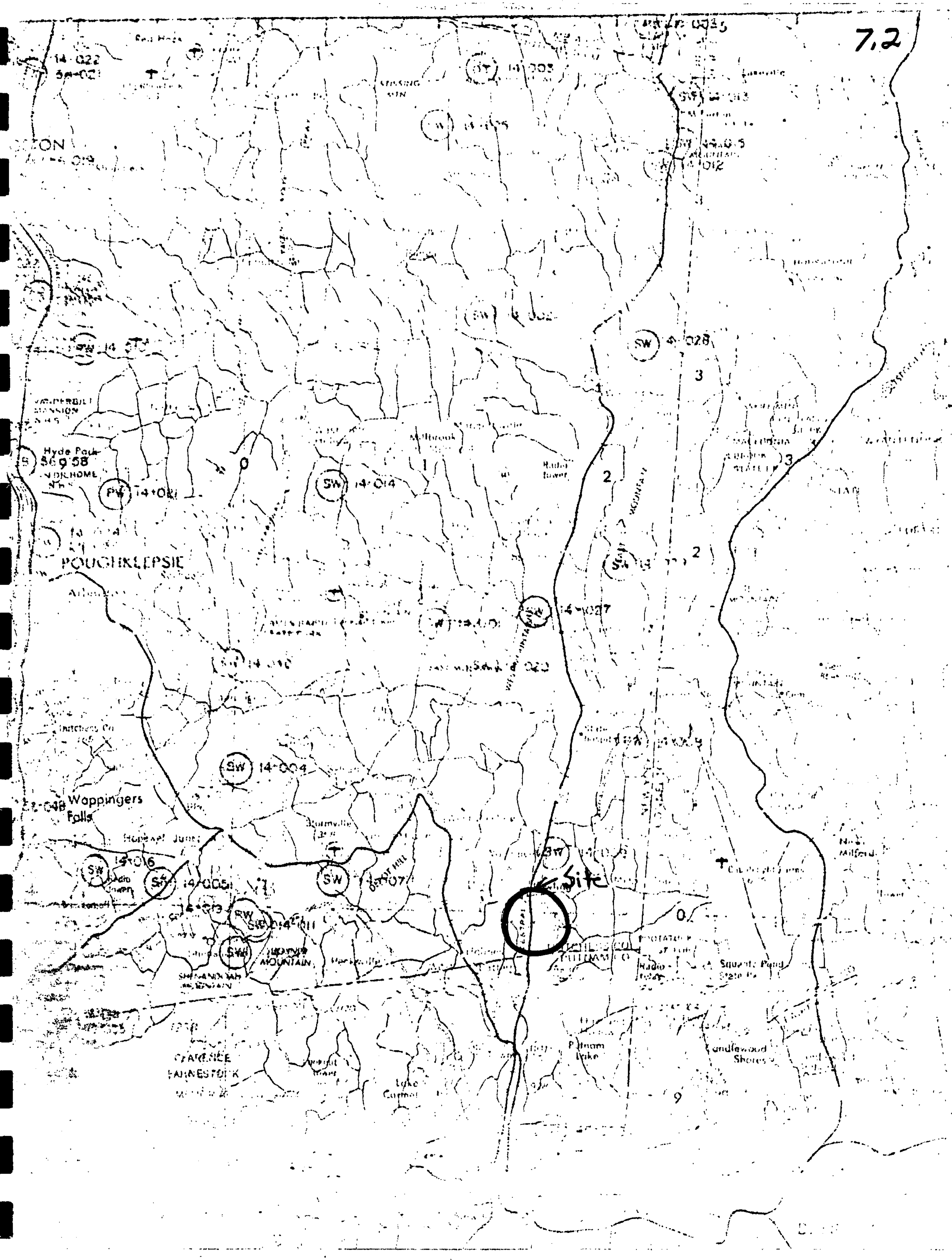


QUAD: HARTFORD

SCALE: 1:250,000

HARTFORD CONN NISEI N J MASS

REVISED: 12/31/85


7.2
14-022
POUGHKEEPSIE
Hyde Park
Wappingers
Falls
Millbrook
SW 14-014
PW 14-021
SW 14-004
SW 14-016
14-005
SW 14-028
14-027
SW
RW
Site
Putnam
Lake
Candlewood
Shores
CLARENCE
FAHNESTOCK
Lake
Carmel
Squantz Pond
State Pk
Radio
tower

Ref. 8.1

New York State Atlas of Community Water System Sources

1982

NEW YORK STATE
DEPARTMENT OF HEALTH

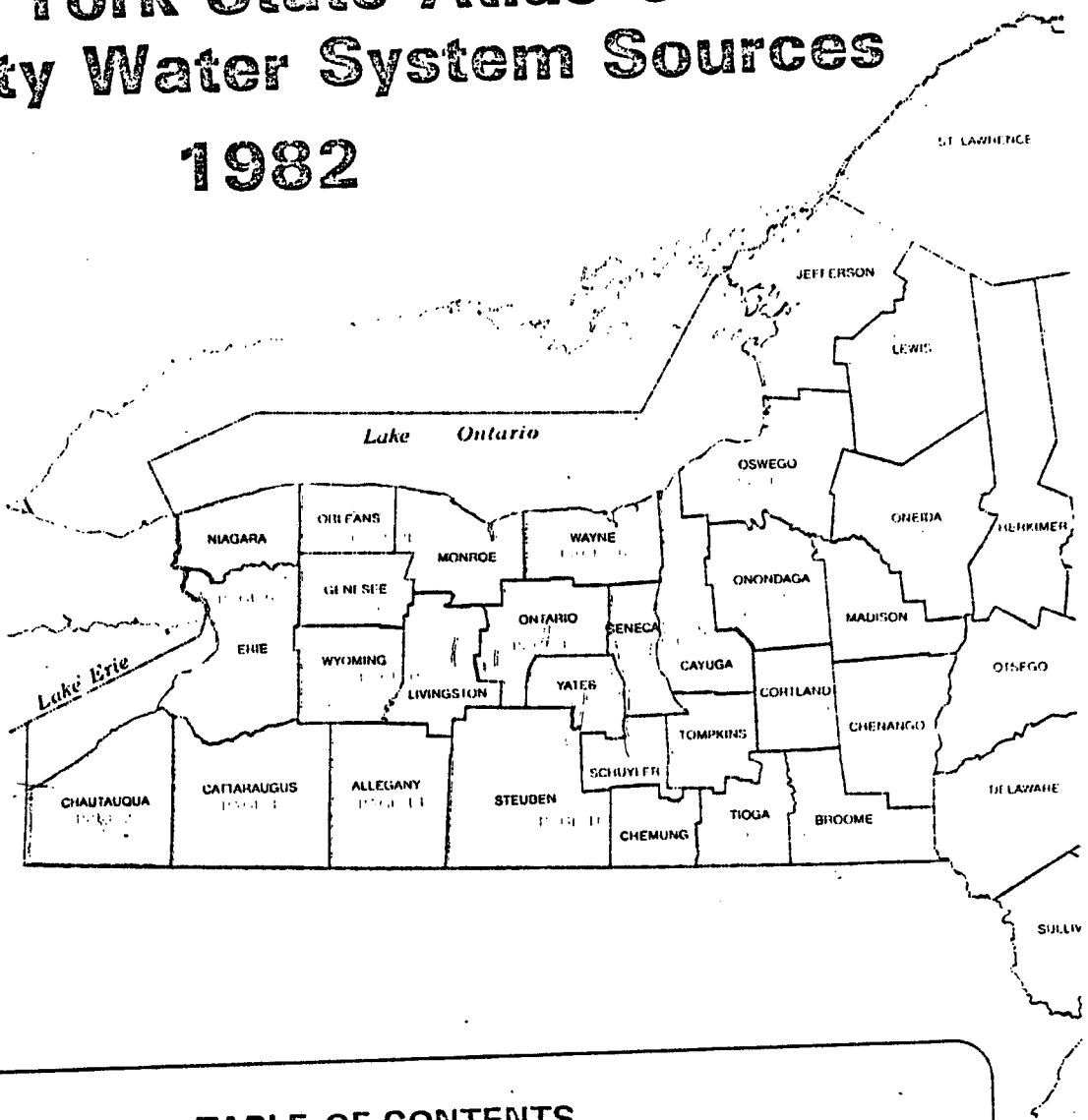
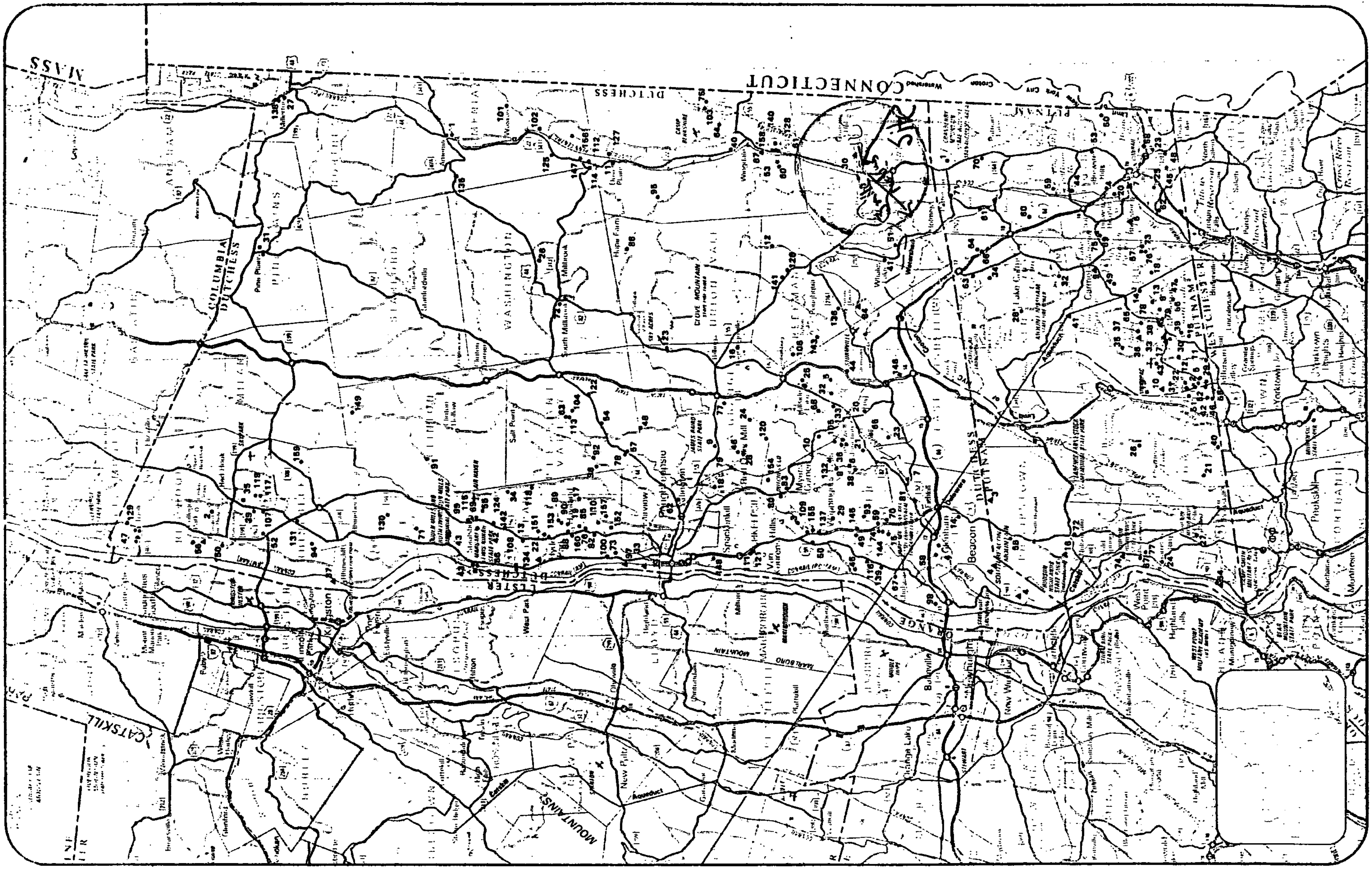


TABLE OF CONTENTS

LOCATION OF COMMUNITY WATER SYSTEM SOURCES-1982

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF PUBLIC WATER SUPPLY PROTECTION

DUTCHESS and PUTNAM COUNTIES



8.3

DUTCHESS COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
	Municipal Community		
1	[illegible] Water District #1	1000.	Wells
2	[illegible] Water Company	1006.	Wells
3	[illegible] Water Company	1300.	Wells
4	Beacon City (See also No 3 Putnam Co)	5000.	Mt. Beacon & Melzinga Reservoirs, Wells
5	[illegible] Country Club	300.	Wells
6	[illegible] Acres Water Company	920.	Wells
7	[illegible] Water Company	3500.	Wells
8	[illegible] Improvement Area	1800.	Wells
9	[illegible] Estates Water District	900.	Wells
10	[illegible]	600.	Wells
11	[illegible] Plains Water Company	1500.	Wells
12	[illegible] Ridge Estates	60.	Wells
13	Dutchess Estates [illegible]	700.	Wells
14	Fishkill Village	6000.	Wells
15	Fleetwood Manor Water District	850.	Wells
16	Grandview Water District	160.	Wells
17	Greenfield Water District	1250.	Wells
18	[illegible] Park Water Company	350.	Wells
19	[illegible] Hills Water Company Inc.	900.	Wells
20	[illegible], Inc.	275.	Wells
21	[illegible] Services Inc.	900.	Wells
22	Hyde Park Fire & Water District	4000.	Crum Elbow Creek, Wells
23	[illegible] Park Water Company	65.	Wells
24	La Grange [illegible] Estates	120.	Wells (Infiltration Gallery)
25	Little [illegible] Water Company	600.	Wells
26	Millbrook Village	1735.	Wells
27	Millerton Village	1600.	Wells
28	[illegible] Knolls Water District	250.	Wells
29	[illegible]	310.	Wells
30	Pawling Village	2000.	Pawling Reservoir, Wells
31	[illegible] Water Company	1050.	Wells
32	[illegible]	265.	Wells
33	Poughkeepsie City	30000.	Hudson River
34	[illegible] Estates Water District	424.	Wells
35	Red Hook Village	2000.	Wells
36	[illegible] Park Water Company	550.	Wells
37	Rhinebeck Village	4200.	Hudson River
38	[illegible] Farms	3000.	Wells
39	[illegible] Homes, Inc.	184.	Wells
40	[illegible] Water Works	110.	Wells
41	[illegible] Civic Association	300.	Wells
42	South Cross Pond Water Company Inc.	572.	Wells (Infiltration Gallery)
43	[illegible] Water Company	1072.	Indian Kill Reservoir, Wells
44	Taconic Estates	185.	Wells
45	Tall Trees	250.	Wells
46	[illegible] Water District	700.	Wells
47	[illegible] Village	713.	Wells
48	Valley [illegible] Water Company	380.	Wells
49	Wappinger [illegible]	400.	Wells
50	Wappingers Falls Village	5300.	Wells
51	Willow [illegible] Water Company	125.	Wells
52	Windermere [illegible]	375.	Wells
	Non-Municipal Community		
53	Angels Trailer [illegible]	40.	Wells
54	Arbor [illegible] Apartments	59.	Wells
55	[illegible] Court #1	72.	Wells
56	Bard College	NA.	Sawkill Creek
57	Beckwith Trailer Park	26.	Wells
58	BGB Mobile Home Park	137.	Wells
59	[illegible] Mobile Home Park	42.	Wells
60	Brooks Mobile Home Park	25.	Wells
61	[illegible] Trailer Park	16.	Wells
62	Canterbury Garden Apartments	600.	Wells
63	[illegible] Mobile Home Park	90.	Wells
64	Cedar [illegible] Mobile Home Park #2	28.	Wells
65	[illegible] Mobile Trailer Park	110.	Wells
66	Chateau [illegible] Home for Adults	120.	Wells
67	[illegible] Apartments	1800.	Wells
68	[illegible] Branch Apartments	19.	Wells
69	Colonial Manor Trailer Park	30.	Wells
70	[illegible] Trailer Park	35.	Wells
71	[illegible] View Apartments	95.	Wells
72	[illegible]	70.	Wells
73	[illegible] Garden Apartments	450.	Wells
74	[illegible] Trailer Park	30.	Wells
75	[illegible] Mountain Trailer Park	28.	Wells
76	[illegible]	200.	Wells
77	[illegible] Apartments	36.	Wells
78	[illegible] Mobile Home Park	92.	Wells
79	[illegible] Trailer Court	60.	Wells
80	[illegible] Apartments	59.	Wells
81	[illegible] Park Apartments	240.	Wells
82	[illegible] Village	50.	Wells
83	[illegible]	30.	Wells
84	Green Haven Correctional Facility	NA.	Reservoir
85	[illegible] Trailer Court	44.	Wells
86	[illegible] School	300.	Wells
87	Harlem Valley Psychiatric Center	1200.	Swamp River
88	[illegible] Apartments	100.	Wells
89	[illegible] Mobile Home Park #1	44.	Wells
90	[illegible] Mobile Home Park #2	29.	Wells

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
	Non-Municipal Community		
91	Hi Vu	50.	Wells
92	Hickory Hill Mobile Home Park	250.	Wells
93	Hidden Hollow Apartments	850.	Wells
94	Hidden Valley Mobile Court	30.	Wells
95	High Meadows Park Inc.	196.	Wells
96	Hoffman Trailer Park	26.	Wells
97	Hudson River Psychiatric Center	2000.	Hudson River
98	Hudson View Water Works	1800.	Wells
99	Hyde Park Mobile Manor Estates	NA.	Wells
100	Hyde Park Terrace Apartments	70.	Wells
101	Kent Hollow Apartments	24.	Wells
102	Kommel Trailer Park	20.	Wells
103	Lake Ellis Mobile Home Park	81.	Wells
104	Lake Lodges Apartments	24.	Wells
105	Lake Walton Park	62.	Wells
106	Lakeview Mobile Home Park	NA.	Wells
107	Lamplight Court Mobile Estates	23.	Wells
108	Ledges Apartments	460.	Wells
109	Little Falls Trailer Park	163.	Wells
110	M and D Mobile Home Park	108.	Wells
111	Maple Lane Trailer Park	150.	Wells
112	May Lane Mobile Park	30.	Wells
113	Maynards Mobile Manor	101.	Wells
114	McCartha's Trailer Park	42.	Wells
115	Mobile Home Gardens	30.	Wells
116	Montclair Townhouse Apartments	660.	Wells
117	Mountain View Mobile Estates	55.	Wells
118	Northeastern Conference Nursing Home	120.	Wells
119	Northern Dutchess Mobile Home Park	31.	Wells
120	Odells Trailer Park	19.	Wells
121	Osborne Trailer Park	15.	Wells
122	Palmer Apartments	27.	Wells
123	Parkway Apartments	16.	Wells
124	Partridge Hill Apartments	150.	Wells
125	Phillips Trailer Park	45.	Wells
126	Pine Grove Mobile Home Park	39.	Wells
127	Powell Road Mobile Park	115.	Wells
128	Ramsey's Trailer Park	25.	Wells
129	Red Church Trailer Park	32.	Wells
130	Rhinebeck Country Village	100.	Wells
131	Rhinebeck Mobile Court	120.	Wells
132	Roberts Running Creek Trailer Park	88.	Wells
133	Route 82 Trailer Park	26.	Wells
134	Royal Crest Apartments	158.	Wells
135	Sabo Trailer Park	45.	Wells
136	Smith Mobile Home Park	25.	Wells
137	Scenic Apartments	432.	Wells
138	Scenic View Mobile Home Park	27.	Wells
139	Shady Acres Trailer Park	26.	Wells
140	Shady Homes Trailer Park	42.	Wells
141	Shady Lane Trailer Park	13.	Wells
142	Simpson Mobile Home Site	27.	Wells
143	Springhill Mobile Home Park	NA.	Wells
144	Sunset Farms Mobile Home Park	35.	Wells
145	Sunset Knolls	50.	Wells
146	Taconic Motor Lodge	22.	Wells
147	Tally Ho Mobile Estates	NA.	Wells
148	Tai Apartments	14.	Wells
149	The Lodge at Rhinebeck	NA.	Wells
150	Unification Theological Church	153.	Wells
151	Val Kill Park East	72.	Wells
152	Valley Forge Mobile Home Park	60.	Wells
153	Venture Lake Estates	44.	Wells
154	Village Crest Apartments	600.	Wells
155	Wappingers Falls Trailer Park	50.	Wells
156	Wassaic Developmental Center	2300.	Wells
157	Willow Tree Park	30.	Wells
158	Wingdale Village Park	72.	Wells
159	Woodcrest Manor Adult Home	NA.	Wells
160	Woodfield Apartments	7.	Wells

PUTNAM COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
	Municipal Community		
1	Alpine Village	140.	Wells
2	Archer Estates	100.	Wells
3	Beacon City (See Dutchess Co)		Cargill Reservoir
4	Blackberry Hill	400.	Wells
5	Bonnville Water Company	360.	Wells
6	Brewster Heights	1100.	Middle Branch Reservoir
7	Brewster Village	3200.	East Branch Croton River
8	Capri Estates	120.	Wells
9	Carmel Water District #2	4000.	Lake Gleneida
10	Carmel Water District #3	1600.	Lake Secor
11	Carmel Water District #4- Baldwin Water Company	1600.	Wells
12	Carmel Water District #5- Maple Terrace	180.	Wells
13	Carmel Water District #6- Shell Valley	324.	Wells
14	Carmel Water District #7- Tomahawk Creek	68.	Wells
15	Chateau Ridge	300.	Wells
16	Cold Springs Village	3000.	Foundry Brook Reservoir
17	Colonial Drive	105.	Lake Mahopac
18	Country Hill Estates	200.	Wells
19	Crescent Road Water Supply	20.	Wells
20	First Brewster Corporation	255.	Wells
21	Floradan Lodge	400.	Wells
22	Forest Park Homes	200.	Wells
23	Fox Hill Estates	128.	Wells
24	Garrison Water Supply	84.	Wells (Infiltration Gallery)
25	George Walsh	48.	Wells
26	Glenmar Gardens	NA.	Wells
27	Greymoor Village	220.	Wells
28	Gypsy Trail Club	300.	Wells
29	Hillsdale Estates	240.	Wells
30	Indian Hill	56.	Wells
31	Ivy Hill Water Supply	260.	Wells
32	Kent Water District #1	360.	Wells
33	Lake View Park	400.	Lake Mahopac
34	Leeside Estates	256.	Wells
35	London Bridge Water Works	298.	Wells, Well (Infiltration Gallery)
36	Mahopac Hills	440.	Lake Mahopac
37	Mahopac Lake Shore Estates	80.	Wells
38	Mahopac Ridge Water Supply	1600.	Lake Mahopac
39	Mahopac Water Company	500.	Wells
40	Mill Pond Water Supply	70.	Wells
41	New York City - Aqueduct System (page 76)		Bog Brook, East Branch and Middle Branch Reservoirs (Croton Aqueduct System); Boyd Corners[1] (drained, unsafe dam), Croton Falls[2], and West Branch Reservoirs[1] (Croton and Delaware Aqueduct Systems)
42	Rainbow Hill Estates	320.	Wells
43	Red Mills Water Supply	400.	Wells
44	Spring Knoll Estates	20.	Wells
45	Star Ridge Manor	368.	Wells
46	Sunrise Ridge	178.	Wells
47	Union Valley Estates	290.	Wells
48	Vails Grove	510.	Wells
49	West Branch Acres	240.	Wells
50	Wildwood Homes	148.	Wells
51	Wood Hill Estates	100.	Wells
52	York View	200.	Wells
	Non-Municipal Community		
53	Brewster Woods Condominium	200.	Wells
54	Capuchin Theological Seminary	65.	Reservoir, Wells
55	Carpenter Trailer Park	NA.	Wells
56	Casa Serena Rest Home	30.	Wells
57	Clearing in the Woods	162.	Wells
58	Cold Spring Trailer Court	15.	Wells
59	Elek Apartments	48.	Wells
60	Forest Haven Apartments	400.	Wells
61	Harmony Trailer Park	NA.	Wells
62	Holly Stream Condominium Apartments	225.	Wells
63	Kent Apartments	56.	Wells
64	Kent Nursing Home	355.	Wells
65	Knolls Trailer Court	NA.	Wells
66	Ludingtonville Apartments	40.	Wells
67	Malcolm Gordon School	41.	Wells
68	Meadow Motor & Mobile Home Court	30.	Wells
69	Middle Branch Apartments	41.	Wells
70	Patterson Trailer Park	80.	Wells
71	Patterson Village Condominiums	197.	Wells
72	Post Road Mobile Home Park	NA.	Wells
73	Putnam Community Hospital	111.	Wells
74	St Basil Academy	40.	Indian Brook
75	Tilly Foster Apartments	36.	Wells
76	Vista on the Lake Condominiums	402.	Wells
77	Walter Hoving Home	25.	Wells
78	Wendolin Town House Apartments	150.	Wells
79	Woodcrest Apartments	400.	Wells

[1] Functions as part of Delaware System, overflow goes into Croton System.

[2] Functions as part of the Croton System, but has limited capability to pump into the Delaware System.

Reference 9.1

POPULATION COUNT

Population within a 3-mile radius of each Phase I site is determined using the coordinate system illustrated below. The number of residences for each quadrant and section is determined by overlaying this pattern onto a U.S.G.S. 7.5 minute topographic map. A multiplier of 3.8 persons per residence is used to determine population in accordance with Mitre Model 1985.

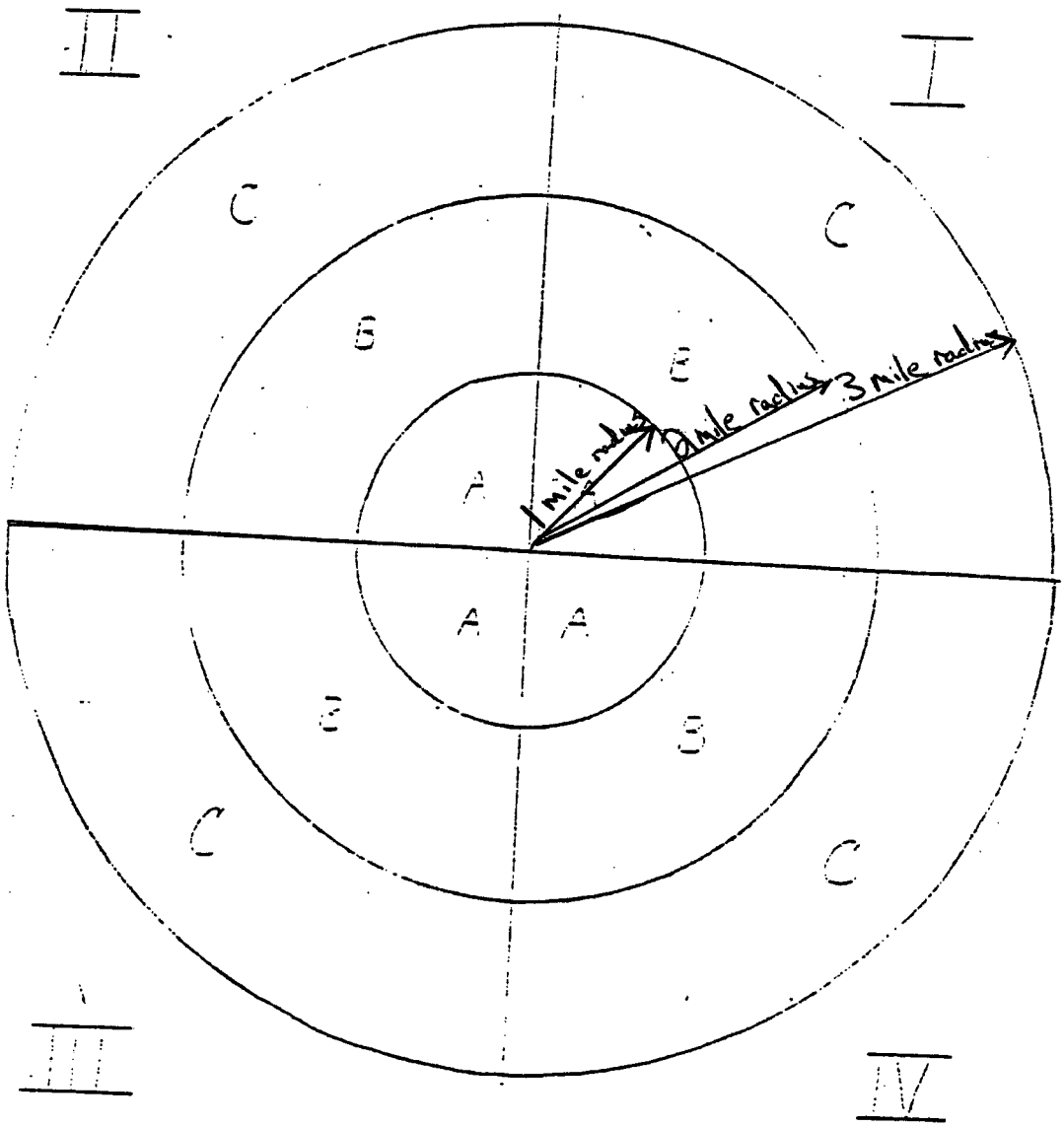
A = 1 mile radius — 106 dwellings x 3.8 = 403

B = 2 mile radius — 121 dwellings x 3.8 = 1193

C = 3 mile radius — 314 dwellings x 3.8 = 1319

Total Population = 2915

(Figure not To Scale)

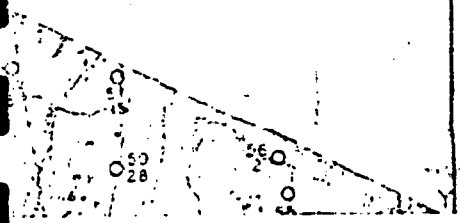


Reference
10.1

NEW Y

MAP OF DUTCHESS COUNTY, NEW YORK

SHOWING LOCATION OF SELECTED WELLS AND SPRINGS



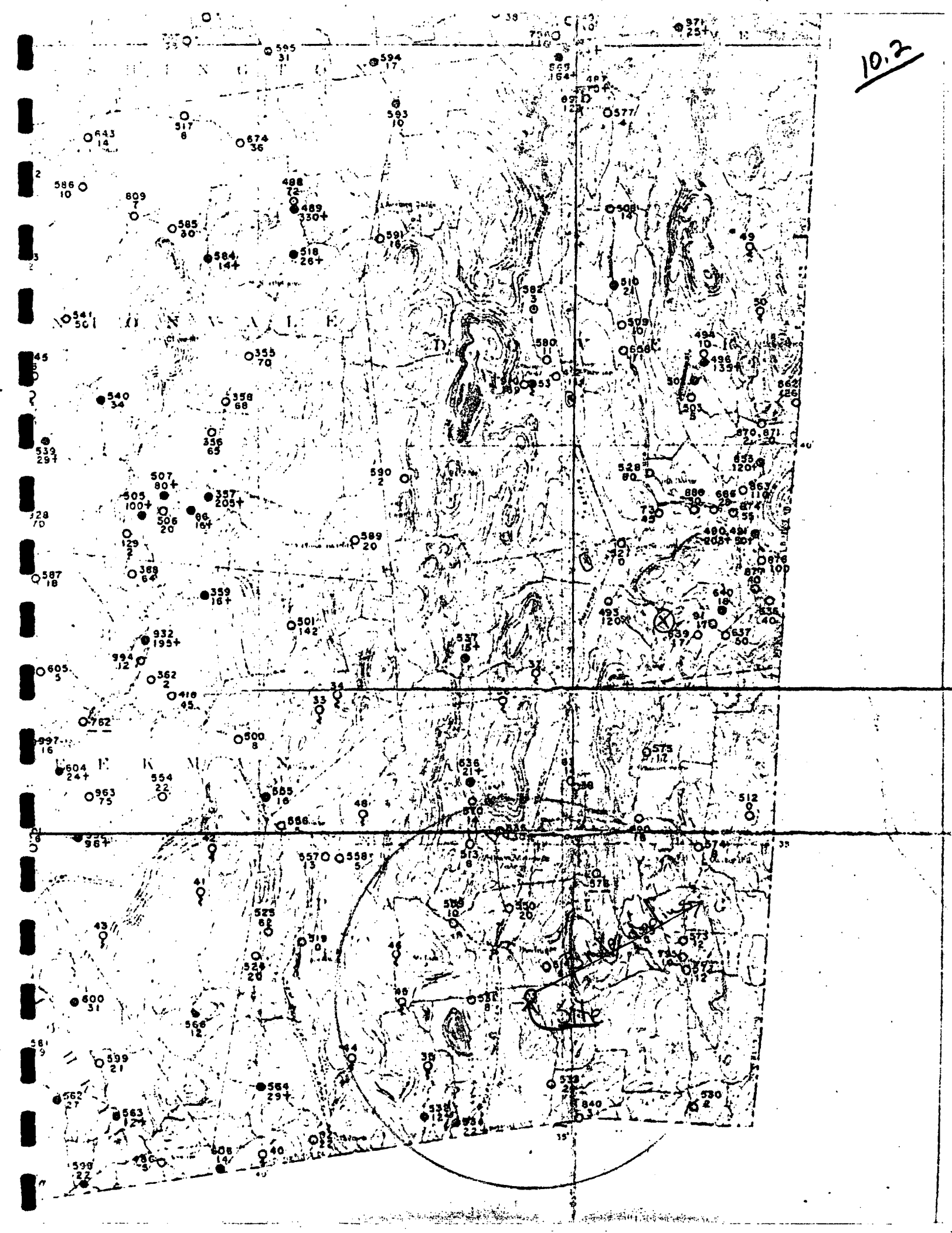

10.2

Table 13.--Records of selected wells in Dutchess County

Location: See section entitled "Explanation of Tables."

Altitude above sea level: Approximate altitude from topographic maps.

Type of well: Drl, drilled; Dug, dug; Drv, driven.

Water level: Reported average water level. Plus sign (+) preceding figure indicates level to which water rises above land surface.

Use: Com, commercial; Dom, domestic; Ind, industrial; PS, public supply.

Remarks: gpd, gallons per day; gpm, gallons per minute; (a) water analysis in table 10; (b) log of well in table 12.

Well number	Location	Owner or occupant	Altitude above sea level (feet)	Type of well	Depth below land surface (feet)	Diameter (inches)	Depth to bedrock (feet)	Water-bearing formation	Water level below land surface (feet)	Method of lift	Yield (gallons per minute)	Use	Remarks
Du 1	13Y, 4.3N, 5.8W	Edward Lasher	80	Drl	69	6	44	Hudson River formation	8	Force	20	Farm	
Du 2	13Y, 3.7N, 6.2W	J. M. Coon	190	Drl	75	6	54	do.	25	None	2	None	Yield inadequate. Well destroyed.
Du 4	13Y, 3.2N, 6.0W	W. H. Radder	200	Drl	77	6	50	do.	12	--	35	Dom	
Du 7	13Y, 3.7N, 6.7W	Edward Sturges	220	Drl	210	6	6	do.	20	Suction	20	Dom	
Du 8	13Y, 3.8N, 7.1W	J. Rockefeller	280	Drl	144	6	12	do.	12	do.	40	Dom	
Du 9	13Y, 3.6N, 7.6W	Charles Deneger	220	Drl	112	6	8	do.	17	Jet	3	Farm	No increase in yield below a depth of 70 ft.
Du 12	13Y, 4.0N, 9.0W	Roland Redmond	60	Drl	321	8 to 6	99	do.	34	None	--	None	Well abandoned.
Du 13	13Y, 4.0N, 8.7W	do.	100	Drl	320	10 to 8	43	do.	39	--	4	None	do.
Du 14	13Y, 4.1N, 8.0W	Village of Tivoli	120	Drl	60	10	40	do.	20	Turbine	60	PS	Average consumption is 4,000 gpd. (b).
Du 15	13Y, 4.9N, 8.6W	Albert Sengstack	180	Drl	79	6	23	do.	26	Force	4	Dom	
Du 16	13Y, 5.1N, 8.8W	Howland Davis	160	Drl	202	6	9	do.	--	do.	36	Dom	
Du 18	13Y, 4.8N, 7.3W	O. L. Cole	180	Drl	127	6	62	do.	7	--	20	Farm	
Du 19	13Y, 4.5N, 6.7W	J. Hainshon	180	Drl	67	6	40	do.	14	Force	20	Farm	
Du 20	13Y, 3.2N, 4.1W	George Hubbard	180	Drl	60	6	25	do.	5	Suction	20	Dom	
Du 25	13Y, 1.0N, 6.7W	C. Schaffer	200	Drl	137	6	19	do.	32	None	10	Dom	Yield 0.75 gpm when well was 90 ft deep. (b).
Du 26	13Y, 1.9N, 6.3W	Malcolm Cooper	200	Drl	197	6	57	do.	2	do.	20	Farm	
Du 28	13Y, 3.3N, 7.6W	M. Schweiger	200	Drl	54	6	13	do.	30	Force	5	Dom	
Du 32	13Y, 1.7N, 7.9W	Samuel Robbins	200	Drl	98	6	15	do.	35	do.	12	Farm	
Du 35	13Y, 1.4N, 8.3W	William Blohm	160	Drl	78	6	10	do.	2	Jet	2	Dom	
Du 36	13Y, 1.6N, 8.2W	C. Sottery	160	Drl	132	6	--	do.	17	Suction	5	Dom	Yield 2.5 gpm when well was 27 ft deep. (a).
Du 38	13Y, 0.8N, 8.3W	R. Bolander	160	Drl	74	6	18	do.	--	--	5	Com	
Du 39	13Y, 0.1N, 8.5W	Duncan Watt	180	Drl	97	6	11	do.	13	Suction	8	Dom	
Du 40	13Y, 1.5N, 8.7W	A. C. Zabriskie	120	Drl	620	6	40	do.	60	do.	3	Dom	Listed in U. S. Geol. Survey Water-Supply Paper 102 (see well 147, p. 133).
Du 41	13Y, 0.9N, 6.3W	Ira Barringer	200	Drl	110	6	52	do.	6	--	40	Dom	
Du 42	13Y, 1.9N, 5.4W	H. Fraleigh	200	Drl	84	6	14	do.	12	--	30	Dom	
Du 43	13Y, 2.4N, 7.2W	Percy Sherman	260	Drl	132	6	40	do.	12	--	17	Dom	
Du 44	13Y, 2.3N, 7.6W	Harold Wheeler	240	Drl	88	6	17	do.	3	--	30	Dom	
Du 45	13Y, 2.3N, 4.6W	J. J. Rall	180	Dug	12	48	--	Pleistocene deposit	8	Suction	2	Dom	
Du 46	13Y, 2.8N, 3.6W	G. Osborne	340	Drl	86	6	5	Hudson River formation	24	--	12	Dom	
Du 48	13Y, 1.1N, 3.0W	A. Singher	380	Drl	229	6	--	do.	40	Force	15	Farm	(a).
Du 50	13Y, 1.9N, 2.8W	P. Clemets	360	Drl	62	6	28	do.	--	--	5	Dom	Well supplies two homes.
Du 51	13Y, 2.7N, 2.7W	F. C. Wolcott	290	Drl	118	6	15	do.	14	Suction	5	Farm	
Du 53	13Y, 0.5N, 2.6W	John Odak	540	Drl	84	6	15	do.	20	--	4	Dom	
Du 54	13Y, 1.0N, 2.3W	Clinton Gallagher	580	Drl	118	6	6	do.	6	Suction	4	Farm	Yield 2 gpm when well was 40 ft deep.
Du 55	13Y, 1.7N, 1.3W	E. A. Trotter	500	Drl	107	6	85	do.	15	Force	5	Dom	

10.3

Table 13.--Records of selected wells in Dutchess County (Continued)

Well number	Location	Owner or occupant	Altitude above sea level (feet)	Type of well	Depth below land surface (feet)	Diameter (inches)	Depth to bedrock (feet)	Water-bearing formation	Water level below land surface (feet)	Method of lift	Yield (gallons per minute)	Use	Remarks
Du 519	14Y, 13.0S, 5.0E	Sanita Hills Camp	900	Drl	185	6	0	Hudson River formation	37	Force	20	None	Three other abandoned wells on property.
Du 524	14Y, 13.3S, 4.3E	Interchurch Camp Society, Inc.	740	Drl	52	8 to 6	20	Cheshire quartzite and granite and gneiss, undiff.	18	do.	8	Dom	Drawdown 30 ft after pumping 8 gpm for 8 hrs.
Du 525	14Y, 12.8S, 4.5E	Whaley Lake Inn	720	Drl	72	6	62	Granite and gneiss, undiff.	24	do.	--	Dom	
Du 526	15Y, 2.0N, 8.6W	Robert Lyons	220	Drl	30	6	--	Pleistocene sand and gravel	4	Suction	25	Dom	
Du 527	14Y, 7.2S, 9.5E	Wingdale Hotel	430	Drl	130	6	0	Stockbridge limestone	--	--	--	Dom	
Du 528	14Y, 6.2S, 10.0E	Brookshire Manor	330	Drl	180	6	80	do.	7	Suction	--	Dom	
Du 529	15Y, 8.0N, 2.6W	Harry Sickle	400	Drl	87	6	30	Hudson River formation	16	do.	6	Dom	(b).
Du 530	14Y, 15.4S, 10.7E	G. O'Hara	1,260	Drl	185	6	2	do.	--	Jet	30	Dom	Yield 20 gpm when well was 150 ft deep. Temperature 50°F, June 1949.
Du 531	14Y, 13.8S, 7.3E	Charles Utter	520	Drl	300	6	8	Stockbridge limestone	8	Suction	6	Dom	
Du 532	14Y, 15.5S, 6.7E	H. Krojalis	700	Dug	12	48	--	Pleistocene sand and gravel	--	do.	--	Dom	
Du 533	14Y, 15.0S, 8.5E	Ralph Gwinn	450	Drl	130	6	28	Stockbridge limestone	26	Turbine	40	Com	Temperature 54°F, June 1949.
Du 534	14Y, 15.6S, 7.2E	A. Pennell	530	Dug	22	48	--	Pleistocene sand and gravel	14	Suction	--	Farm	
Du 535	14Y, 11.4S, 7.8E	H. J. Kurris	460	Drl	130	6	--	Pleistocene deposit	--	Jet	--	Farm	
Du 536	14Y, 10.8S, 7.3E	George Dykeman'	530	Dug	21	48	--	Pleistocene till	6	Suction	--	Dom	
Du 537	14Y, 9.0S, 7.3E	William Greimer	500	Dug	15	57	--	do.	10	do.	--	Farm	
Du 539	14Y, 5.7S, 1.3E	J. B. Walsh	540	Dug	29	48	--	do.	13	do.	--	Dom	Well used only in summer.
Du 540	14Y, 5.1S, 2.1E	A. Broome	750	Dug	34	53	34	Pleistocene sand	18	Hand	--	Dom	do.
Du 541	14Y, 3.9S, 1.6E	E. F. Acken	730	Drl	102	6	50	Hudson River formation	14	Jet	8	Farm	Yield 2 gpm when well was 75 ft deep.
Du 542	14Y, 1.8S, 0.8E	El Rancho	520	Drl	98	6	21	do.	18	do.	7	Com	Yield did not increase below depth of 83 ft.
Du 543	14Y, 3.1S, 0.7E	Paul Berger	720	Drl	293	6	12	do.	--	Force	30	Farm	
Du 545	14Y, 4.8S, 1.1E	W. R. Parliman	580	Drl	64	6	6	do.	4	Suction	8	Farm	
Du 546	15Y, 0.9S, 10.2W	Dutchess County Broadcasting Co.	1,305	Drl	185	6	0	Granite and gneiss, undiff.	--	--	5	Dom	
Du 547	14Y, 0.2S, 8.6E	Carl Sabo	400	Drl	184	6	--	Pleistocene deposit	--	None	7.5	Dom	Well abandoned; water contained clay.
Du 548	15Y, 11.7N, 1.4W	Dutchess Hatchery	330	Drl	115	6	16	Hudson River formation	--	--	11	Farm	Two other wells on property, 415 ft and 385 ft dee produced no water.
Du 549	13Y, 17.1S, 8.7E	F. Schern	400	Drl	155	6	110	Stockbridge limestone	38	Jet	40	Dom	
Du 550	14Y, 12.5S, 7.9E	Pawling Rubber Corp.	440	Drl	145	6	20	do.	4	do.	50	Ind	Drawdown 10 ft after pumping 50 gpm for 10 hrs. Temperature 51°F, June 1949. Average consumptio is 30,000 gpd. (a).
Du 551	14Y, 11.9S, 0.7E	Peter O'Brien	360	Dug	10	36	10	Pleistocene gravel	9	Suction	14	Dom	Well supplies 5 families and small airport.
Du 552	14Y, 11.5S, 1.7E	Samuel Sottile	380	Drl	96	6	--	do.	--	Jet	40	Dom	Well flows; supplies restaurant and 15 families. (a) (b).

Table 13.--Records of selected wells in Dutchess County (Continued)

Well number	Location	Owner or occupant	Altitude above sea level (feet)	Type of well	Depth below land surface (feet)	Diameter (inches)	Depth to bedrock (feet)	Water-bearing formation	Water level below land surface (feet)	Method of lift	Yield (gallons per minute)	Use	Remarks
Du 553	14Y, 9.2S, 0.2E	Samuel Sottile	480	Drl	271	6	8	Hudson River formation	18	Force	9	Dom	
Du 554	14Y, 10.8S, 2.9E	Kendall Bros.	460	Drl	205	6	22	Stockbridge limestone	35	Jet	7	Farm	
Du 555	14Y, 10.9S, 4.4E	Joseph B. Inness	580	Dug	16	36	16	Pleistocene till	6	Suction	--	Dom	
Du 556	14Y, 11.3S, 4.7E	Albert Burdick	550	Drl	125	6	5	Granite and gneiss, undiff.	21	Force	25	Dom	Well supplies 3 families.
Du 557	14Y, 11.8S, 5.3E	John Tartaro	820	Drl	50	6	13	do.	10	Suction	8	Dom	
Du 558	14Y, 11.8S, 5.5E	do.	900	Drl	235	6	5	do.	12	Jet	6	Dom	Yield 2 - 3 gpm when well was 90 ft deep.
Du 559	14Y, 12.7S, 7.1E	do.	500	Drl	125	6	10	Stockbridge limestone	5	Suction	20	Dom	
Du 560	14Y, 13.4S, 0.7E	Bertha Van Anden	380	Drl	135	6	--	do.	10	Force	--	Farm	
Du 561	14Y, 14.5S, 1.0E	A. Petersen	980	Dug	34	36	19	Pleistocene gravel	29	do.	--	Dom	
Du 562	14Y, 15.2S, 1.4E	Camp Alamar, Inc.	660	Dug	37	36	27	Pleistocene sand	7	Suction	--	Dom	
Du 563	14Y, 15.4S, 2.3E	C. Thornton	800	Dug	12	36	--	Pleistocene till	9	do.	--	Dom	
Du 564	14Y, 15.0S, 4.3E	M. Pendley	920	Dug	29	48	--	do.	16	do.	--	Dom	
Du 566	14Y, 14.0S, 3.4E	F. J. Clamp	920	Dug	14	54	12	do.	11	do.	--	Dom	
Du 567	15Y, 10.5N, 6.6W	George Wolf	140	Drl	65	6	40	Hudson River formation	--	Jet	9	Dom	Well flows at 3 gpm. (a).
Du 569	14Y, 12.6S, 0.2E	Farm Supply Co.	340	Drl	226	6	56	Stockbridge limestone	15	Suction	45	Dom	
Du 570	14Y, 11.0S, 7.4E	G. E. Stone	550	Drl	499	6	14	do.	42	Force	7	Farm	
Du 572	14Y, 13.4S, 10.5E	H. Littell	950	Drl	406	6	12	Hudson River formation	42	do.	4	Dom	
Du 573	14Y, 13.0S, 10.5E	J. R. Branch	960	Drl	307	6	12	do.	47	Turbine	5	Dom	
Du 574	14Y, 11.6S, 10.8E	Anna Thomas	1,260	Drl	235	6	8	do.	19	Force	--	Dom	
Du 575	14Y, 10.3S, 9.9E	Quaker Lake Inc.	810	Drl	153	6	17	do.	20	Jet	18	Dom	
Du 576	14Y, 12.0S, 9.2E	T. E. Dewey	770	Drl	850	8	--	do.	--	Force	--	Farm	
Du 577	14Y, 1.0S, 9.4E	Dutchess County Lime Co.	400	Drl	418	6	4	Stockbridge limestone	5	--	--	None	
Du 578	13Y, 16.7S, 8.9E	Charles Webster	470	Drl	55	6	39	do.	19	Jet	12	Dom	
Du 580	14Y, 4.6S, 8.4E	Fairview Manor	450	Drl	160	6	11	do.	--	do.	30	Com	(a).
Du 582	14Y, 3.8S, 8.3E	John Hauff	410	Drl	100	6	3	Unknown	22	--	8	Dom	(a).
Du 583	15Y, 3.0N, 8.0W	Fishkill Rural Cemetery	240	Drl	126	6	8	Stockbridge limestone	9	Centrifugal	10	Dom	(a).
Du 584	14Y, 3.1S, 3.6E	E. Dunlavey	690	Dug	14	36	--	Pleistocene till	11	Suction	--	Dom	
Du 585	14Y, 2.6S, 3.1E	Claude Abel	730	Drl	94	6	30	Hudson River formation	18	Jet	25+	Farm	Two other wells and several other springs also on property.
Du 586	14Y, 2.0S, 1.8E	William Adel	590	Drl	100	6	10	do.	20	do.	--	Dom	
Du 587	14Y, 7.7S, 1.1E	A. B. Huges	740	Drl	450	6	18	do.	--	Force	--	Dom	
Du 588	14Y, 8.3S, 0.6E	W. J. Crocker	680	Drl	250	6	10	do.	--	Jet	60	Farm	Well supplies two homes.
Du 589	14Y, 7.1S, 5.8E	A. B. Hamal	1,220	Drl	159	6	20	do.	--	Force	3	Dom	

Reference 11

TELEPHONE CONVERSATION MEMORANDUM

CLIENT NYSDEC

PROJ. No. 06281

PROJECT

DATE 10/30/86

TIME 1:20 P.M.

CALL TO/FROM Laura Zaines

REPRESENTING Dutchess County Soil and Water Conservation District

PHONE No. (914) 677-8011

SUMMARY OF CONVERSATION:

Laura Zaines representing the Dutchess County Soil and Water Conservation knows of no such irrigation practices being done within a three mile radius of the NYSDOT spill.

COPIES TO:

BY: S. Petrisko

S. Petrisko

WEHRAN ENGINEERING
CONSULTING ENGINEERS

EPA FORMS 2070-12 AND 2070-13

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	314060

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
NYSDOT Spill No. 811902	Route 22

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Pawling	NY	12564	Dutchess		

09 COORDINATES LATITUDE ___ ___ ___.___ | LONGITUDE ___ ___ ___.___

10 DIRECTIONS TO SITE (Starting from nearest public road)
Take Route 22 north Brady Brook, south of Akindale Road to Corrol Ford (off Route 22)

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)
Cole Petroleum	Route 22

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Pawling	NY	12564	( )

07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
■ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES ☐ NO DATE 1 / 8 / 86 (MONTH DAY YEAR)
BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☒ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)
CONTRACTOR NAME(S): Wehran Engineering

02 SITE STATUS (Check one)
☒ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
BEGINNING YEAR ____ ENDING YEAR ____ ☒ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
Gasoline Components; Benzene, Toluene, M-Xylene, O-Xylene, Ethyl benzene, Tetrachloroethylene

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
Chemicals present in water supply wells.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
■ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Dennis G. Fenn	Wehran Engineering	(914) 343-0660

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Stephen R. Petrisko		Wehran Engineering	(914) 343-0660	11 / 5 / 86 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE: NY | 02 SITE NUMBER: 314060

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS _____

NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☒ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☒ G. FLAMMABLE
- ☒ H. IGNITABLE
- ☒ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
Sol	Benzene	71-43-2		91	ug/l
Sol	Toluene	108-88-3		2870	ug/l
Sol	Xylene			1610	ug/l
Sol	Ethyl benzene	100-41-4			
Sol	Tetrachloroethylene				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sampling results)

NYSDEC inactive Hazardous Waste Disposal Site Report.
Galson Technical Services; laboratory analysis report 12/17/83

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	314060

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION — 02 [X] OBSERVED (DATE: 6/24/83) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Observed groundwater contamination determined from laboratory analysis of samples obtained from monitoring wells installed on-site.

01 [X] B. SURFACE WATER CONTAMINATION — 02 [ ] OBSERVED (DATE: _____) — [X] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Potential surface water contamination due to gasoline spill, and nearest surface water approximately 1,000 feet from site.

01 [ ] C. CONTAMINATION OF AIR — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 [X] D. FIRE/EXPLOSIVE CONDITIONS — 02 [ ] OBSERVED (DATE: _____) — [X] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Potential fire/explosive conditions exist due to gasoline spill.

01 [X] E. DIRECT CONTACT — 02 [ ] OBSERVED (DATE: _____) — [X] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Possible direct contact due to gasoline contaminated drinking wells.

01 [X] F. CONTAMINATION OF SOIL — 02 [ ] OBSERVED (DATE: _____) — [X] POTENTIAL — [ ] ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) 04 NARRATIVE DESCRIPTION
Potential soil contamination due to gasoline spill, and observed groundwater contamination.

01 [X] G. DRINKING WATER CONTAMINATION — 02 [X] OBSERVED (DATE: 3/22/82) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Private drinking water wells contaminated with gasoline

01 [ ] H. WORKER EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 [X] I. POPULATION EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE: _____) — [X] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Possible population exposure/injury via direct contact route due to gasoline contaminated drinking wells.

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 314060

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include common name(s) of species)

Unknown

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

No method of containment of wastes has been observed or documented.

01 ☒ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

01 ☒ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYSDEC Inactive Hazardous Waste Disposal Site Report
Hydrogeologic evaluations oil spill Village of Pawling Dutchess County, NY

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

EPA

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 314060

II. SITE NAME AND LOCATION

01 SITE NAME	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
NYSDOT Spill No. 811902	Route 22				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
Pawling	NY	12564	Dutchess		

09 COORDINATES: LATITUDE 41° 32' 08" N | LONGITUDE 73° 35' 08" W

10 TYPE OF OWNERSHIP: ☒ A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
1 / 8 / 86 (MONTH DAY YEAR)	☒ ACTIVE ☐ INACTIVE	_____ (BEGINNING YEAR) _____ (ENDING YEAR) X UNKNOWN

04 AGENCY PERFORMING INSPECTION: ☐ A. EPA ☐ B. EPA CONTRACTOR _____ ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ ☐ E. STATE ☒ F. STATE CONTRACTOR Wehran Engineering ☐ G. OTHER _____

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
David B. Tompkins	Environmental Scientist	Wehran	(914) 343-0660
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Stephen R. Petrisko	Environmental Technician	Wehran	(914) 343-0660
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Mr. Jay Maxwell, Sr.	Resident	Rt. 22, Pawling, NY	( )
Mr. Jay Maxwell, Jr.	Resident	Rt. 22, Pawling, NY	( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	1:00 p.m.	20°, Clear, Cold

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Dennis G. Fenn	Wehran Engineering	(914) 343-0660

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Stephen R. Petrisko		Wehran	(914)343-0660	11 / 5 / 86 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	314060

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS _____
- CUBIC YARDS _____
- NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☒ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☒ G. FLAMMABLE
- ☒ H. IGNITABLE
- ☒ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
Sol	Benzene	71-43-2		91	ug/l
Sol	Toluene	108-88-3		2870	ug/l
Sol	Xylene			1610	ug/l
Sol	Ethyl benzene	100-41-4			
Sol	Tetrachloroethylene				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sampling results, reports)

NYSDEC Inactive Hazardous Waste Disposal Report
Galson Technical Services; laboratory analysis report 12/17/86

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE: NY	02 SITE NUMBER: 314060

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☒ OBSERVED (DATE: 6/24/83) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Observed groundwater contamination determined from laboratory analysis of samples obtained from monitoring wells installed on-site.

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Potential surface water contamination due to gasoline spill.
Nearest surface water approximately 1,000 feet from site.

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☒ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Potential fire/explosive conditions exist due to gasoline spill.

01 ☒ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Possible direct contact due to gasoline contaminated drinking wells.

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) 04 NARRATIVE DESCRIPTION
Potential soil contamination due to gasoline spill.

01 ☒ G. DRINKING WATER CONTAMINATION — 02 ☒ OBSERVED (DATE: 3/22/82) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Private drinking water wells contaminated with gasoline

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☒ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Possible population exposure/injury via direct contact route due to gasoline contaminated drinking wells.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	314060

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include species of concern)

Unknown

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

No method of containment of wastes has been observed or documented.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYSDEC Inactive Hazardous Waste Disposal Site Report
Hydrogeologic Evaluations Oil Spill Village of Pawling, Dutchess County, NY

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	314060

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☒ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCINERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER

☒ A. BUILDINGS ON SITE

06 AREA OF SITE

20 (Acres)

07 COMMENTS

Gasoline contaminated drinking wells located in a commercial area along Route 22 in Pawling, NY

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☒ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

No method of containment of wastes has been observed or documented.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☒ YES ☐ NO

02 COMMENTS

Private drinking water wells contaminated with gasoline.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

NYSDEC Inactive Hazardous Waste Disposal Site Report
Hydrogeoligic Evaluations, Oil Spill, Village of Pawling by Empire Soils Investigations, Inc. and Thomsen Associates

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	314060

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as appropriate)

	SURFACE	WELL
COMMUNITY	A. ☐	B. ☐
NON-COMMUNITY	C. ☐	D. ☒

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☒	F. ☒

03 DISTANCE TO SITE

A. On-site (mi)
B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☒ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (Alternate water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 2,915

03 DISTANCE TO NEAREST DRINKING WATER WELL on-site (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
10-19 (ft)	Southward to Southwestward	_____ (ft)	_____ (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including casings, depth, and location relative to population and buildings)

19 monitoring wells installed on-site. Depths range from 11 feet to 38 feet.

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☐ NO	COMMENTS	☐ YES ☐ NO	COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Brady Brook	☐	1,000 ft. (mi)
_____	☐	_____ (mi)
_____	☐	_____ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 403 NO. OF PERSONS	B. 1,596 NO. OF PERSONS	C. 2,915 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION

1/4 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE

227

04 DISTANCE TO NEAREST OFF-SITE BUILDING

1/8 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

The area is predominantly commercial with few homes scattered throughout the area. There are private homes within 1,000 feet of the site.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	314060

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. 10^{-6} – 10^{-8} cm/sec ☐ B. 10^{-4} – 10^{-6} cm/sec ☐ C. 10^{-4} – 10^{-3} cm/sec ☒ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE (10^{-4} – 10^{-6} cm/sec) ☒ C. RELATIVELY PERMEABLE (10^{-2} – 10^{-4} cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
15-30 (ft)	Unknown (ft)	Unknown	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
16 (in)	2.5 (in)	up to 10 %	Southwest	5-6 %

09 FLOOD POTENTIAL

SITE IS IN 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE	OTHER
A. _____ (mi)	B. > 1 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

N/A _____ (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AG LAND
A. on-site (mi)	B. _____ (mi)	C. _____ (mi)	D. _____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The site is situated in the valley of the East Branch of the Croton River. Elevations on the valley floor in the area range from approximately 430 to 450 feet above mean sea level. Uplands marginal to the valley form scarps rising rapidly to elevations of 850 feet or more above mean sea level.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sampling results, reports)

Hydrogeologic Evaluations by Empire Soils Investigations, Inc. and Thomsen Associates.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	314060

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	N.A.	Camo Laboratories; Galson Technical	available
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☐ AERIAL

02 IN CUSTODY OF Wehran Engineering
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Wehran Engineering

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sampling reports)

Hydrogeologic Evaluations by Empire Soils Investigations, Inc.
and Thomsen Associates.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	314060

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Maxwell Engine Rebuilders						
Corral Ford						
Heinchon Dairy						
Mario's Pizza						

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable; list most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYSDEC Region 3 File Documents

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	314060

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	14 CITY	15 STATE / 16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD		
01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	14 CITY	15 STATE / 16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD /		
01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	14 CITY	15 STATE / 16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD		

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	314060

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	314060

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	314060

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	314060

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

6.0 ASSESSMENT OF DATA ADEQUACY AND RECOMMENDATIONS

6.0 ASSESSMENT OF DATA ADEQUACY AND RECOMMENDATIONS

6.1 GROUNDWATER ROUTE

With quantitative evidence available to confirm a direct release to groundwater, a complete Phase II investigation is not recommended at this time.

A preliminary score of S_{gw} = 65.62 was computed from information in the Federal and State files and the site inspection.

6.2 SURFACE WATER ROUTE

The preliminary surface water route score is 7.44. Brady Brook is located approximately within 1,000 feet of the site. No documentation of any release to this surface water has been obtained. In order to verify the threat of potential surface water contamination, a one-time sampling event is recommended to determine if migration of contaminants to the stream has occurred.

6.3 AIR ROUTE

No measurable readings of organic vapors were detected with the HNU Photoionizer during the site inspection. To score an air release, qualitative sampling is required along with details on the sampling protocol and the meteorological conditions during the sampling event.

6.4 FIRE AND EXPLOSION

To score the fire and explosion hazard mode either a state or local fire marshall must have certified that the facility presents a significant fire or explosion threat to the public or to a sensitive environment, or there must be a demonstrated threat based on field observations (e.g., combustible gas indicator readings). The available records give no indication that either one of these tasks has been done.

6.5 DIRECT CONTACT

The direct contact route score (S_{DC}) for this site is 12.50. There are no incidents due to direct contact; however, migration of contamination off site is suspect and of concern.

6.6 RECOMMENDATIONS

Due to the existing data documenting a release to the groundwater route, a Phase II investigation is not warranted at the NYSDOT Spill No. 811902 site. Therefore, the site is recommended for consideration by the NYSDEC Bureau of Remedial Action for an appropriate remedial program.

APPENDIX

September 9, 1985

Corral Ford
Route 22
Pawling, NY 12564

Attn: Robert Carpenter

Re: Spill No. 811902, PIN SP 1633.701
Pawling, Dutchess County

Dear Mr. Carpenter:

Attached find the chemical analysis (Gasoline Components in Water) of one water sample taken before a previously installed charcoal filter at your location on August 13, 1985.

The analysis indicates that your well water is free of gasoline contamination at this time. For questions regarding the interpretation of this report, contact the Dutchess County Health Department for assistance.

Based on the laboratory results for the last several months, this office will cease any further active involvement in this portion of the project.

The charcoal filters are scheduled to be removed at the end of September, 1985. If you choose to maintain the filters yourself, contact Culligan Water Conditioning at (914) 454-4010 to make the necessary arrangements.

Should you have any questions concerning this matter, contact this office at (914) 431-5771.

Very truly yours,

James D. Bailey
Regional Oil Spill Engineer

by:

John Schaff
Assistant Oil Spill Engineer

JDB/JS/ls
Attachment
cc: M. Clarke, Oil Spill Bureau, Albany, 5/216
C. Manfredi, NYSDEC--Region 3, White Plains

COUNTY OF WESTCHESTER
DEPARTMENT OF LABORATORIES AND RESEARCH
VALHALLA, NEW YORK 10595

RESULTS OF ANALYSES - GASOLINE COMPONENTS (DOH 310-19)

Lab No. 3439
Date Rec'd 8/14/85

Bottle No. _____
Date Coll'd 8/13/85
Time: 1-55 pm

Agency Coll'd for NYS DOT Coll'd By M. Wetzel
Collected From: Name Corral Ford
(Last) (First)

Address Pawling N.Y. Dutch
(St. Rd.) (Town Village City) (Zip Code) (County)

Sampling Point _____ Identification of Source Spill #811902
P.I.N.: SP1633.70

Gasoline Criteria according to New York State Department of Transportation. Test Procedure for Gasoline Components in Water (Purgeable Aromatics) (DOH Procedures 310-19):

1. The following compounds must be present:

Compounds	ug/L
Benzene	3.2
Toluene	<1
Ethylbenzene	<1
m-xylene	<1
p-xylene	<1
o-xylene	<1

2. The xylene isomers must be approximately the same concentration (within a factor of 2).

3. Presence of additional peaks in the chromatogram with the following retention times (Benzene = 1.0 minutes)
*Major peaks - must be present.

Method R. T.'s (min.)	Actual R. T.'s (min.)
3.9	
4.25*	
4.5*	
4.7*	
5.1*	
5.6	
5.9	

☐ Gasoline Criteria Met _____

☑ Gasoline Criteria Not Met _____

☐ Unknown Compound present

Reported By _____ Date Reported 8/20/85

— Environmental Conservation
— Wolf Road, Albany, New York 12233-0001

Henry G. Williams
Commissioner

TO: B. Bishop, Contract Unit, Rm. 619

FROM: O. Faldet Regional Spill Engr., Region 3

SUBJECT: VOUCHER PAYMENT PACKAGE (NON-CONTRACT)
Vendor's Name Culligan Water - Buffalo
SP 86-33711 SPILL NO. 8119C
LOCATION Darien, Genesee County

DATE: 9/15/86

Narrative of Events

Date of Spill: Unknown
Location of Spill: Darien, Genesee County
Spiller: Unknown
Material Spilled: gasoline
Amount Spilled: Unknown
Amount Recovered: none
Project Status (Current, Future): Filters are installed at 2 shops (surplus store) at this time. The other filters have been removed as other businesses no contamination have been found. DEC is continuing to investigate.
Purpose of Expenditure (What, Why):
Expenditures are for rental of small tanks for August thru October.

Attached are one original and three copies of the following documents for work performed from 9/1/86 to 10/31/86.

✓ NYSDEC Certification for Payment (AC 1882) $ 165.00

✓ Voucher (AC92) $ 165.00

✓ Invoice 6776

_____ Standard Clauses (For Payment over $2,500) (32-02-2)

_____ Solicitation Record as Required

_____ Written Quotations as required

TP/ts

Attachments

cc: T. Plesnarski, Spill Response Section, Rm. 326 (cover letter only)

STATE OF NEW YORK

STANDARD VOUCHER

Voucher No. 55306

Originating Agency: NYS Dept Enviro Conservation

Orig. Agency Code: 09001

2 P-Contract

Payment Date (MM) (DD) (YY): 10/10/86

OSC Use Only

Liability Date (MM) (DD) (YY): 08/01/86

3 Payee ID	Additional	Zip Code	Route	Payee Amount
14-1464893				105.00

4 Payee Name (Limit to 30 spaces): Culligan Dutchess-Putnam

1099 Code

5 Discount %: 09/10/86

Payee Name (Limit to 30 spaces): Water Conditioning Inc.

Statistic Type

Statistic

Address (Limit to 30 spaces): 39 Friendly Lane

6 Ref/Inv. No. (Limit to 20 spaces): 20078

Address (Limit to 30 spaces)

Ref/Inv. Date (MM) (DD) (YY): 08/25/86

City (Limit to 20 spaces): Poughkeepsie

State (Limit to 2 spaces): NY

Zip Code: 12603

7 Purchase Order No. and Date	Description of Material/Service If items are too numerous to be incorporated into the block below, use form AC 93 and carry total forward.	Quantity	Unit	Price	Amount
	2 Guy-Patterson- XXXXXX				
	August-Oct rental of 2 M oil tanks $35.00				105 00

RECEIVED SEP 10 1986

RECEIVED SEP 8 1986 NYSDEC WHITE PLAINS

8 Payee Certification:
I certify that the above bill is just, true and correct; that no part thereof has been paid except as stated and that the balance is actually due and owing, and that taxes from which the State is exempt are excluded.

William F Schneider — Payee's Signature in Ink

Accounts Receivable — Title

9-4-86 — Date

Culligan Dutchess-Putnam Water Cond. Inc. — Name of Company

Total	105 00
Discount %	
Net	105.00

FOR AGENCY USE ONLY

Merchandise Received: 10/1/86 — Date

Page No.

By

I certify that this voucher is correct and just, and payment is approved.

Authorized Signature

Date — Title

STATE COMPTROLLER'S PRE-AUDIT

Verified

Audited

Special Approval (as required)

Certified For Payment of Net Amount

By

Expenditure								Liquidation			
Dept.	Cost Center	Var	Yr	Object	Accum Dept	Accum Statewide	Amount	Orig Agency	PO/Contract	Line	F/P
90	163379	—	86	55950			105 00				

Check if Continuation form is attached.

OSC

September 9, 1985

Marios Pizza
Route 22
Pawling, NY 12564

Re: Spill No. 811920, PIN SP 1633.701
Pawling, Dutchess County

Dear Sir:

Attached find the chemical analysis (Gasoline Components in Water) of one water sample taken before a previously installed charcoal filter at your location on August 13, 1985.

The analysis indicates that your well water is free of gasoline contamination at this time. For questions regarding the interpretation of this report, contact the Dutchess County Health Department for assistance.

Based on the laboratory results for the last several months, this office will cease any further active involvement in this portion of the project.

The charcoal filters are scheduled to be removed at the end of September, 1985. If you choose to maintain the filters yourself, contact Culligan Water Conditioning at (914) 454-4010 to make the necessary arrangements.

Should you have any questions concerning this matter, contact this office at (914) 431-5771.

Very truly yours,

James D. Bailey
Regional Oil Spill Engineer

by:

John Schaff
Assistant Oil Spill Engineer

JDB/JS/ls
Attachment
cc: M. Clarke, Oil Spill Bureau, Albany, 5/216
C. Manfredi, NYSDEC--Region 3, White Plains
E. Marx, Dutchess County Health Department

COUNTY OF WESTCHESTER
DEPARTMENT OF LABORATORIES AND RESEARCH
VALHALLA, NEW YORK 10595

RESULTS OF ANALYSES - GASOLINE COMPONENTS (DOH 310-19)

Lab No. 3438
Date Rec'd 8/14/85

Bottle No. _____
Date Coll'd 8/13/85
Time: 1-40 Pm

Agency Coll'd for NYS DOT Coll'd By M. Wetzel
Collected From: Name Marrio's Pizza
(Last) (First)

Address Pawling, NY. Dutch.
(St. Rd.) (Town Village City) (Zip Code) (County)

Sampling Point _____ Identification of Source Spill #311902
PIN: SP1633.701

Gasoline Criteria according to New York State Department of Transportation. Test Procedure for Gasoline Components in Water (Purgeable Aromatics) (DOH Procedures 310-19):

1. The following compounds must be present:

Compounds	ug/L
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m-xylene	<1
p-xylene	<1
o-xylene	<1

2. The xylene isomers must be approximately the same concentration (within a factor of 2).

3. Presence of additional peaks in the chromatogram with the following retention times (Benzene = 1.0 minutes)
*Major peaks - must be present.

Method R. T.'s (min.)	Actual R. T.'s (min.)
3.9	
4.25*	
4.5*	
4.7*	
5.1*	
5.6	
5.9	

☐ Gasoline Criteria Met _____

☑ Gasoline Criteria Not Met _____

☐ Unknown Compound present-

September 9, 1985

Mr. and Mrs. Kent Johnson
Heinchon Dairy
Box 327
Pawling, NY 12564

Re: Spill No. 811920, PIN SP 1633.701
Pawling, Dutchess County

Dear Mr. and Mrs. Johnson:

Attached find the chemical analysis (Gasoline Components in Water) of one water sample taken before a previously installed charcoal filter at your location on August 13, 1985.

The analysis indicates that your well water is free of gasoline contamination at this time. For questions regarding the interpretation of this report, contact the Dutchess County Health Department for assistance.

Based on the laboratory results for the last several months, this office will cease any further active involvement in this portion of the project.

Should you have any questions concerning this matter, contact this office at (914) 431-5771.

Very truly yours,

James D. Bailey
Regional Oil Spill Engineer

by:

John Schaff
Assistant Oil Spill Engineer

JDB/JS/ls
Attachment
cc: M. Clarke, Oil Spill Bureau—Albany, 5/216
C. Manfredi, NYSDEC--Region 3, White Plains
E. Marx, Dutchess County Health Department

COUNTY OF WESTCHESTER
DEPARTMENT OF LABORATORIES AND RESEARCH
VALHALLA, NEW YORK 10595

RESULTS OF ANALYSES - GASOLINE COMPONENTS (DOH 310-19)

Lab No. 3440 Bottle No. _____
Date Rec'd 8/14/85 Date Coll'd 8/13/85
Time: 1-25 PM

Agency Coll'd for NYS DOT Coll'd By M. Wetzel
Collected From: Name HEINCHON Dairy
(Last) (First)

Address Pawling, N.Y. Dutch.
(St. Rd.) (Town Village City) (Zip Code) (County)

Sampling Point _____ Identification of Source spill #811962 PIN: SP1633.70

Gasoline Criteria according to New York State Department of Transportation. Test Procedure for Gasoline Components in Water (Purgeable Aromatics) (DOH Procedures 310-19):

1. The following compounds must be present:

Compounds	ug/L
Benzene	23
Toluene	<1
Ethylbenzene	<1
m-xylene	<1
p-xylene	<1
o-xylene	<1

2. The xylene isomers must be approximately the same concentration (within a factor of 2).

3. Presence of additional peaks in the chromatogram with the following retention times (Benzene = 1.0 minutes)
*Major peaks - must be present.

Method R. T.'s (min.)	Actual R. T.'s (min.)
3.9	—
4.25*	—
4.5*	—
4.7*	—
5.1*	—
5.6	—
5.9	—

☐ Gasoline Criteria Met _____

☑ Gasoline Criteria Not Met _____

☐ Unknown Compound present

Reported By _____ Date Reported 8/22/85

NYS DOT Spill Site #314960.

		22 NOV 1983	29 FEB 1984	26 APRIL 1984	6 JULY 1984	23 JAN 1985	13 AUG 1985
MAXWELL	Benzene	1500	1100	830	440		160
	Toluene	2900	1600	870	130		83
	Xylene P	380	550	390	146		
	m	710	1500	290	024		858
	o	380	510	170	015		
	Eth. Benzene	390	500	350	145		77
	Gasoline	NO	NO	YES	NO		NSu
VENZIA	Benzene						
	Toluene						1
	Xylene						
	TTCE			2	5		1.1
	Gasoline	NO	NO	NO	NO		NO
JOHNSON	Benzene	110	93	092		023	74
	Toluene	13	06	005			20
	Xylene P	21		2		1	<1
	m	01		1			
	o	05		1			
	Eth. Benzene		11	10			5.4
	Gasoline	NO	NO	NO	NO	NO	NO
CARPENTER	Benzene	4100	3			3.2	1.5
	Toluene	420	10				
	Xylene P	083		1	1		1
	m	110					
	o	053					
	Gasoline	YES	NO	NO	NO	NO	NO
MARIO PIZZA	Benzene	072			35		6.9
	Toluene	025			3		
	Xylene P	04			3	1	1
	m	05			1		
	o	07			1		
	TCE	031					14
	TTCE		39	33	09		14
	Gasoline	NO	NO	NO	NO	NO	NO

NEW YORK STATE REGISTRY FORM

47-15-11(2/80)

HAZARDOUS WASTE DISPOSAL SITES REPORT
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Code: 2a

Site Code: 314060

Name of Site: NYSDOT Spill No. 811902 Region: 3

County: Dutchess Town/City Pawling

Street Address Route 22

Status of Site Narrative:

Commercial area along Route 22, north of Brady Brook and south of Akindale Road, just north of town line of Patterson in PUtnam County.

The following parcels, whose wells were tested, indicate gasoline present in well:

1) Maxwell Engine Rebuilders
2) Inex Venezia, guest house
3) Corral Ford
4) Heinchon Dairy
5) Mario's Pizza

Type of Site: Open Dump ☐ Treatment Pond(s) ☐ Number of Ponds
Landfill ☐ Lagoon(s) ☐ Number of Lagoons
Structure ☐

Estimated Size 20 Acres

Hazardous Wastes Disposed? Confirmed ☒ Suspected ☐

*Type and Quantity of Hazardous Wastes:

TYPE	QUANTITY (Pounds, drums, tons, gallons)
Benzene	
Toluene	
M-xylene	
O-xylene	
Ethyl benzene	

* Use additional sheets if more space is needed.

Name of Current Owner of Site: Unknown

Address of Current Owner of Site: Unknown

Time Period Site Was Used for Hazardous Waste Disposal:

, 1960's To Current , 19

Is site Active ☐ Inactive ☒
(Site is inactive if hazardous wastes were disposed of at this site and site was closed prior to August 25, 1979)

Types of Samples: Air ☐ Groundwater ☒ None ☐
Surface Water ☐ Soil ☐

Remedial Action: Proposed ☐ Under Design ☐
In Progress ☐ Completed ☒
Nature of Action:

Status of Legal Action: Unknown State ☐ Federal ☐

Permits Issued: Federal ☐ Local Government ☐ SPDES ☐
Solid Waste ☐ Mined Land ☐ Wetlands ☐ Other ☐

Assessment of Environmental Problems:

Gasoline in private wells and groundwater

Assessment of Health Problems:

Unknown

Persons Completing this Form:

Stephen R. Petrisko — Wehran Engineering

New York State Department of Environmental Conservation — New York State Department of Health

Date